

## WEST Search History





DATE: Sunday, March 14, 2004

Hide?	Set Name	Query	Hit Count
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*DB=USPT; PLUR=YES; OP=ADJ*

<input type="checkbox"/>	L19	l16 and L18	45
<input type="checkbox"/>	L18	l3 same l2	1191
<input type="checkbox"/>	L17	L16 and l1	56
<input type="checkbox"/>	L16	L15 same l2	67
<input type="checkbox"/>	L15	m7 or "m 7"	9198
<input type="checkbox"/>	L14	L13 and l1 and l6	33
<input type="checkbox"/>	L13	amino or nh2	240979
<input type="checkbox"/>	L12	(L11 same l2) and l1 and l6	12
<input type="checkbox"/>	L11	tenebrionis	274
<input type="checkbox"/>	L10	L9 and l6	15
<input type="checkbox"/>	L9	l2 and l3 and l1 not l7	343
<input type="checkbox"/>	L8	l2 and l7 and l1	16
<input type="checkbox"/>	L7	l5 and L6	16
<input type="checkbox"/>	L6	198?.pray.	355700
<input type="checkbox"/>	L5	L4 and l1	175
<input type="checkbox"/>	L4	L3 with l2	700
<input type="checkbox"/>	L3	truncat\$6 or delet\$5	157114
<input type="checkbox"/>	L2	toxin or endotoxin	24921
<input type="checkbox"/>	L1	thuringiensis.ti,ab,clm.	651

END OF SEARCH HISTORY

FILE 'REGISTRY' ENTERED AT 08:42:21 ON 14 MAR 2004  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2004 American Chemical Society (ACS)  
STRUCTURE FILE UPDATES: 12 MAR 2004 HIGHEST RN 662722-88-5  
DICTIONARY FILE UPDATES: 12 MAR 2004 HIGHEST RN 662722-88-5

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

FILE 'REGISTRY' ENTERED AT 08:42:21 ON 14 MAR 2004  
L1 54 S GWGPFGGALYS/QSP

FILE 'CA' ENTERED AT 08:42:58 ON 14 MAR 2004  
FILE COVERS 1907 - 11 Mar 2004 VOL 140 ISS 12  
FILE LAST UPDATED: 11 Mar 2004 (20040311/ED)

L2 19 S L1

FILE 'REGISTRY' ENTERED AT 08:43:35 ON 14 MAR 2004  
L3 49 S L1 AND 585-660/SQL

FILE 'CA' ENTERED AT 08:44:43 ON 14 MAR 2004  
L4 17 S L3

L2 ANSWER 1 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Identifying and reducing the allergenicity of food proteins  
PY 2003

L2 ANSWER 2 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Modified Cry3A toxins having increased toxicity to corn rootworm their nucleic acid sequences, and methods for controlling plant pests  
PY 2003 2003 2003

L2 ANSWER 3 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Kits for the detection of transgenes in food plants for detection of genetically modified organisms in foodstuffs  
PY 2001 2002 2002

L2 ANSWER 4 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Fire ant control using a novel <SYM100>-endotoxin from *Bacillus thuringiensis*  
PY 2001 2002 2003 2002 2003

L2 ANSWER 5 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Substitution analogs of CryIIA <SYM100>-endotoxins with increased effectiveness against *Diabrotica*  
PY 1997

L2 ANSWER 6 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Synthetic insecticidal crystal protein gene for expression in transgenic plants  
PY 1996 2002 1999 2002 1995 1995 1996 2000 2000 2004

L2 ANSWER 7 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Elucidation of the mechanism of CryIIA overproduction in a mutagenized strain of *Bacillus thuringiensis* var. *tenebrionis*  
PY 1994

L2 ANSWER 8 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 *Bacillus thuringiensis* isolates active against lice.  
PY 1993 1993 1993 1996 1994 1988 1998

L2 ANSWER 9 OF 19 CA COPYRIGHT 2004 ACS on STN

FILE 'REGISTRY' ENTERED AT 08:47:05 ON 14 MAR 2004  
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L6 34 S L1 AND 585-643/SQL  
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L7 11 S L6

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L8 1 S 115804-12-1/RN  
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L9 1 S 128123-81-9/RN  
SET NOTICE 1 DISPLAY  
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FILE 'REGISTRY' ENTERED AT 08:52:00 ON 14 MAR 2004  
L10 1 S 124541-32-8/RN  
SET NOTICE 1 DISPLAY  
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FILE 'REGISTRY' ENTERED AT 08:52:25 ON 14 MAR 2004  
L11 1 S 123514-67-0/RN

T1 The reconstruction and expression of a *Bacillus thuringiensis* cryIIA gene in protoplasts and potato plants  
PY 1993

L2 ANSWER 10 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Extending the host range of insecticidal proteins using peptides that bind gut cells  
PY 1991 1992 1991 1999 1992 1994

L2 ANSWER 11 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Synthetic insecticidal crystal protein gene  
PY 1990 1990 1995 1990 1995 1996 1996 1992 1990 2000 1990 1999 2002 2000 2000

L2 ANSWER 12 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Cloning and expression in microorganisms of endotoxin gene of *Bacillus thuringiensis* *tenebrionis*  
PY 1989 1989 1989 1992 1990

L2 ANSWER 13 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Isolation and characterization of EG2158, a new strain of *Bacillus thuringiensis* toxic to coleopteran larvae, and nucleotide sequences of the toxin gene  
PY 1988

L2 ANSWER 14 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Plants transformed with a gene for an insecticidal protein from *Bacillus thuringiensis*  
PY 1989 1989 1989 1989 1989

L2 ANSWER 15 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Cloning of *Bacillus thuringiensis* *tenebrionis* toxin gene and its use in producing coleopteran insect-resistant plants  
PY 1988 1989 1996 2003 1996 1996 1997 1988 1988 1991 1988 1994 1988 1998 1989 1994 2001 1996 1998 2001 1998 2001 2002

L2 ANSWER 16 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Characterization of the coleopteran-specific protein gene of *Bacillus thuringiensis* var. *tenebrionis*  
PY 1988

SET NOTICE 1 DISPLAY  
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L12 1 S 123516-40-5/RN  
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L15 1 S 112659-38-8/RN  
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L2 ANSWER 17 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Molecular cloning and characterization of the insecticidal crystal protein gene of *Bacillus thuringiensis* var. *tenebrionis*  
PY 1987

L2 ANSWER 18 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Nucleotide sequence of a gene encoding an insecticidal protein of *Bacillus thuringiensis* var. *tenebrionis* toxic against *Coleoptera*  
PY 1987

L2 ANSWER 19 OF 19 CA COPYRIGHT 2004 ACS on STN  
T1 Cloning and expression of *Bacillus thuringiensis* toxin gene toxic to beetles of the order *Coleoptera*  
PY 1987 1991 1989 1988 1987 1996 1990 1989 1991 1991 1996 1999 1996 1999 1995 1999

L4 ANSWER 1 OF 17 CA COPYRIGHT 2004 ACS on STN  
T1 Identifying and reducing the allergenicity of food proteins  
PY 2003

L4 ANSWER 2 OF 17 CA COPYRIGHT 2004 ACS on STN  
T1 Modified Cry3A toxins having increased toxicity to corn rootworm, their nucleic acid sequences, and methods for controlling plant pests  
PY 2003 2003 2003

L4 ANSWER 3 OF 17 CA COPYRIGHT 2004 ACS on STN  
T1 Fire ant control using a novel <SYM100>-endotoxin from *Bacillus thuringiensis*  
PY 2001 2002 2003 2002 2003

L4 ANSWER 4 OF 17 CA COPYRIGHT 2004 ACS on STN  
T1 Substitution analogs of CryIIA <SYM100>-endotoxins with increased effectiveness against *Diabrotica* PY 1997

L4 ANSWER 5 OF 17 CA COPYRIGHT 2004 ACS on STN  
T1 Synthetic insecticidal crystal protein gene for expression in transgenic plants  
PY 1996 2002 1999 2002 1995 1995 1996 1996 2000 2000 2004

L4 ANSWER 6 OF 17 CA COPYRIGHT 2004 ACS on STN

TI Elucidation of the mechanism of CryIIIA overproduction in a mutagenized strain of *Bacillus thuringiensis* var. tenebrionis  
 PY 1994  
 L4 ANSWER 7 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI *Bacillus thuringiensis* isolates active against lice  
 PY 1993 1993 1993 1994 1998 1998  
 RN 110463-24-6 RN 130067-79-7 RN 134944-24-4 RN 141033-45-0 RN 141467-09-6  
 RN 151404-48-7 RN 151404-50-1 RN 151404-53-4 RN 134945-86-1 RN 141467-29-0  
 RN 151404-45-4 RN 151404-46-5 RN 151404-47-6 RN 151404-49-8 RN 151404-51-2  
 RN 151404-52-3  
 L4 ANSWER 8 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI The reconstruction and expression of a *Bacillus thuringiensis* cryIIIA gene in protoplasts and potato plants  
 PY 1993  
 L4 ANSWER 9 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI Synthetic insecticidal crystal protein gene  
 PY 1990 1990 1995 1990 1995 1996 1996 1990 1992 1990 2000  
 RN 115804-12-1 RN 128123-81-9 RN 128123-03-5 RN 128123-04-6  
 L4 ANSWER 10 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI Cloning and expression in microorganisms of endotoxin gene of *Bacillus thuringiensis* tenebrionis  
 PY 1993  
 L5 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
 RN 110463-24-6 REGISTRY  
 CN Toxin, (*Bacillus thuringiensis* strain M-7 clone pCH-B3 parasporal crystal precursor reduced) (901) (CA INDEX NAME)  
 OTHER NAMES:  
 CN <SYM100>-Endotoxin CryIIIA (*Bacillus thuringiensis* tenebrionis strain NB176)  
 CN Toxin, <SYM100>-endo- (*Bacillus thuringiensis* tenebrionis strain NB176 gene cryIIIA parasporal crystal)  
 FS PROTEIN SEQUENCE  
 SQL 644  
 SEQ 1 MNPNRSEHD TIKTENNEY PTNHVQYPLA ETPNPTLED NYKEFLRMTA  
 51 DNNTALDSS TTKDVIQGI SWGDLGW GFPEGGALVS FYTNFTIWI  
 101 PSEDPWKAFM EQEALMDOK IADYAKNKAL AELOGLQNV EDYVSALSSW  
 151 QKNPVSRNP HSQGRIRLF SOAESHFRNS MPFSAISGYE VLFLTYAQA  
 201 ANTHFLFKD AIGYEEWGY EKEDIAFYK RQLKLTQET DHCKVNVG  
 251 LDKLRGSSYE SWVNFNRYR EMTLTVDLI ALFPLYDVR LYPKEVKTET  
 301 RDVLTDPVG VNNLRGYGT FSNENYRK PHLDYLRH QFHTRFQPGY  
 351 YGNDSFNYS GNYVSTRPSI GSNDIITSPF YGKNSRPVQ NLEFNKGKY  
 401 RAVANTNLAV WPSAVYSGVT KVEFSQNDQ IDEASTQTYD SKRNVGAYSW  
 451 DSIDLQPPET DPELEKGYH HQLNYMCF LMQGSRGTIPV LVTWHSVDF  
 501 FNMIDSKIT QLPVKAYKL QSGASWAGP RFTGGDIQC TENGSAATY  
 551 VTPDVSYSQK YRARIHYAST SQITFTSLD GAPFNQYFD KTIKNGDTLT  
 601 YNSFNLSFS TPFELSGNNL QIGVTGLSAG DKVYIDKIEF IPVN  
 \*\*RELATED SEQUENCES AVAILABLE WITH SEQLINK\*\*  
 MF Unspecified  
 CI MAN  
 SR CA  
 LC STN Files: CA, CAPLUS, TOXCENTER, USPATFULL  
 7 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 7 REFERENCES IN FILE CAPLUS (1907 TO DATE)  
 L7 ANSWER 1 OF 11 CA COPYRIGHT 2004 ACS on STN  
 TI Modified Cry3A toxins having increased toxicity to corn rootworm, their nucleic acid sequences, and methods for controlling plant pests  
 PY 2003 2003 2003  
 PY 1989 1989 1989 1992 1990  
 RN 110463-24-6 RN 124541-32-8 RN 112659-24-2 RN 124541-05-5 RN 124541-04-4  
 L4 ANSWER 11 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI Isolation and characterization of EG2158, a new strain of *Bacillus thuringiensis* toxic to coleopteran larvae, and nucleotide sequence of the toxin gene  
 PY 1988  
 RN 110463-24-6 RN 123514-67-0 RN 112659-24-2  
 L4 ANSWER 12 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI Plants transformed with a gene for an insecticidal protein from *Bacillus thuringiensis*  
 PY 1989 1989 1989 1989 1989 1990  
 RN 123516-40-5 RN 123516-11-0 RN 62213-36-9  
 L4 ANSWER 13 OF 17 CA COPYRIGHT 2004 ACS on STN  
 TI Cloning of *Bacillus thuringiensis* tenebrionis toxin gene and its use in producing coleopteran insect-resistant plants  
 PY 1988 1989 1996 2003 1996 1996 1997 1988 1988 1991 1988  
 PY 1988 1988 1998 1989 1994 2001 1996 1998 2001 1998 2001  
 RN 120313-96-4 RN 120313-97-5 RN 120313-98-6 RN 120313-99-7 RN 120314-00-3  
 RN 120314-01-4 RN 9027-23-0 RN 108281-08-9 RN 120313-68-0 RN 120313-69-1  
 RN 120313-70-4  
 L4 ANSWER 14 OF 17 CA COPYRIGHT 2004 ACS on STN  
 L7 ANSWER 2 OF 11 CA COPYRIGHT 2004 ACS on STN  
 TI Fire ant control using a novel <SYM100>-endotoxin from *Bacillus thuringiensis*  
 PY 2001 2002 2003 2002 2003  
 L7 ANSWER 3 OF 11 CA COPYRIGHT 2004 ACS on STN  
 TI Synthetic insecticidal crystal protein gene for expression in transgenic plants  
 PY 1996 2002 1999 2002 1995 1995 1996 2000 2000 2004  
 L7 ANSWER 4 OF 11 CA COPYRIGHT 2004 ACS on STN  
 TI The reconstruction and expression of a *Bacillus thuringiensis* cryIIIA gene in protoplasts and potato plants  
 PY 1993  
 L7 ANSWER 5 OF 11 CA COPYRIGHT 2004 ACS on STN  
 AN 113-38937 CA  
 TI Synthetic insecticidal crystal protein gene  
 IN Adang, Michael J.; Rocheleau, Thomas A.; Merlo, Donald J.; Murray, Elizabeth E.  
 PA Lubrizol Genetics, Inc., USA  
 SO Eur. Pat. Appl., 30 pp. CODEN: EPXXDW  
 DT Patent LA English  
 FAN ONT 7  
 PATENT NO. KIND DATE APPLICATION NO. DATE  
 PI EP 359472 A2 19900321 EP 1989-309069 19890907  
 EP 359472 A3 19900725  
 EP 359472 B1 19951227  
 R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE  
 ZA 8906562 A 19900530 ZA 1989-6562 19890828  
 EP 682115 A1 19951115 EP 1995-201374 19890907  
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 AT 132193 E 19960115 AT 1989-309069 19890907  
 ES 2083384 T3 19960416 ES 1989-309069 19890907  
 AU 8941182 A1 19900315 AU 1989-41182 19890908  
 AU 623429 B2 19920514  
 CN 1044298 A 19900801  
 CN 1056880 B 20000927  
 JP 02186989 A2 19900723  
 JP 11266882 A2 19991005  
 JP 2002176995 A2 20020625  
 US 6013523 A 20000111  
 CN 1263946 A 20000823  
 PRAI US 1988-242482 A 19880909  
 embio U.S. priority 9/86

TI Cloning of *Bacillus thuringiensis* tenebrionis toxin gene and its use in producing coleopteran insect-resistant plants  
IN Fischhoff, David Allen; Fuchs, Roy Lee; McPherson, Sylvia Ann; Lavrik, Paul Bruno; Perlak, Frederick Joseph  
PA Monsanto Co., USA  
SO Eur. Pat. Appl., 52 pp. CODEN: EPXXDW  
DT Patent LA English  
FAN CNT 1

PATENT NO. KIND DATE APPLICATION NO. DATE

PI EP 289479 A2 19881102 EP 1988-870070 19880426

EP 289479 A3 19890628

EP 289479 B1 19961106

EP 289479 B2 20030910

R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE

EP 731170 A1 19960911 EP 1996-100978 19880426

R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE

AT 144995 E 19961115 AT 1988-870070 19880426

ES 2094722 T3 19970201 ES 1988-870070 19880426

DK 8802340 A 19881031 DK 1988-2340 19880428

AU 8815273 A1 19881103 AU 1988-15273 19880428

AU 610157 B2 19910516

CN 88102497 A 19881123 CN 1988-102497 19880428

CN 1028497 B 19941109

JP 63287488 A2 19881124 JP 1988-107503 19880428

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RU 2025486 C1 19941230 RU 1988-435607 19880428

JP 2001112490 A2 20010424 JP 2000-272128 19880428

US 5495071 A 19960227 US 1993-72281 19930604

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US 6284949 B1 20010904 US 1998-27998 19980223

JP 10323138 A2 19981208 JP 1998-101210 19980413

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PRAI US 1987-44081 A 19870429

EP 1988-870070 A3 19880426

JP 1988-107503 A3 19880428

JP 1998-101210 A3 19880428

US 1990-523284 B1 19900514

US 1993-72281 A3 19930604

US 1995-435101 B1 19950504

US 1996-759446 A1 19961205

US 1998-27998 A3 19980223

RN 120313-96-4 RN 120313-97-5 RN 120313-98-6 RN 120313-99-7 RN 120314-00-3 RN 120314-01-4 RN 9027-23-0

RN 108281-08-9 RN 120313-68-0 RN 120313-69-1 RN 120313-70-4

L7 ANSWER 10 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 10987114 CA

TI Characterization of the coleopteran-specific protein gene of *Bacillus thuringiensis* var. *tenebrionis*

AU McPherson, Sylvia A.; Perlak, Frederick J.; Fuchs, Roy L.; Marrone, Pamela G.; Lavrik, Paul B.; Fischhoff, David A.

CS Monsanto Co., St. Louis, MO, 63198, USA

SO BiorTechnology (1988), 6(1), 61-6 CODEN: BTCHDA; ISSN: 0733-222X

DT Journal LA English

PI EP 305275 A2 19890301 EP 1988-402115 19880816

EP 305275 A3 19890614

R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE

WO 8901515 A2 19890223 WO 1988-EP752 19880815

WO 8901515 A3 19890601

W: AU, JP, US

AU 8822572 A1 19890309 AU 1988-22572 19880815

JP 02500566 T2 19900301 JP 1988-506676 19880815

PRAI GB 1987-19414 19870817

GB 1987-30261 19871229

WO 1988-EP752 19880815

RN 123516-40-5 RN 123516-11-0 RN 62213-36-9

L7 ANSWER 9 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 110187338 CA

EP 1989-309069 A3 19890907  
JP 1989-235472 A3 19890911  
JP 1988-356822 A3 19890911  
US 1992-827844 B1 19920128  
US 1993-57191 A3 19930503  
US 1995-369839 A3 19950106  
RN 115804-12-1 RN 128123-81-9 RN 128123-03-5 RN 128123-04-6

L7 ANSWER 6 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 11231703 CA

TI Cloning and expression in microorganisms of endotoxin gene of *Bacillus thuringiensis* tenebrionis

IN Sekar, Vaitilingham; Adang, Michael J.

PA Lubrizol Genetics, Inc., USA

SO Eur. Pat. Appl., 29 pp. CODEN: EPXXDW

DT Patent LA English

FAN CNT 1

PI EP 318143 A2 19890531 EP 1988-309438 19881010

EP 318143 A3 19890607

R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE

ZA 8807480 A 19890726 ZA 1988-7480 19881005

AU 8823651 A1 19890413 AU 1988-23651 19881012

AU 628804 B2 19920813

JP 02092287 A2 19900403 JP 1988-259289 19881013

PRAI US 1987-108285 19871013

RN 110463-24-6 RN 124541-32-6 RN 112659-24-2 RN 124541-05-5 RN 124541-04-4

L7 ANSWER 7 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 111209800 CA

TI Isolation and characterization of EG2158, a new strain of *Bacillus thuringiensis* toxic to coleopteran larvae, and nucleotide sequence of the toxin gene

AU Donovan, William P.; Gonzalez, Jose M.; Gilbert, M. Pearce; Dankocsik, Cathy

CS Ecogen Inc., Langhorne, PA, 19047, USA

SO Molecular and General Genetics (1988), 214(3), 365-72 CODEN: MGGEAE; ISSN: 0026-8925

DT Journal LA English

RN 110463-24-6 RN 123514-67-0 RN 112659-24-2

L7 ANSWER 8 OF 11 CA COPYRIGHT 2004 ACS on STN

AN 111188783 CA

TI Plants transformed with a gene for an insecticidal protein from *Bacillus thuringiensis*

IN Vaack, Mark; Hofte, Hermanus; Botterman, Johan

PA Plant Genetic Systems N. V., Belg.

SO Eur. Pat. Appl., 22 pp. CODEN: EPXXDW

DT Patent LA English

FAN CNT 1

PI EP 305275 A2 19890301 EP 1988-402115 19880816

EP 305275 A3 19890614

R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE

WO 8901515 A2 19890223 WO 1988-EP752 19880815

WO 8901515 A3 19890601

W: AU, JP, US

AU 8822572 A1 19890309 AU 1988-22572 19880815

JP 02500566 T2 19900301 JP 1988-506676 19880815

PRAI GB 1987-19414 19870817

GB 1987-30261 19871229

WO 1988-EP752 19880815

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CODEN: NARHAD; ISSN: 0305-1048

DT Journal LA English

RN 112659-37-7 RN 112659-38-8 RN 112659-24-2

pub 9/87

L8 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN

RN 115804-12-1 REGISTRY

CN Toxin, endo- (Bacillus thuringiensis tenebrionis plasmid clone pMON5456 parasporal crystal reduced) (9Ci)

(CA INDEX NAME)

FS PROTEIN SEQUENCE

SQL 597

SEQ 1 MTADNNTAAL DSSTTKDVIQ KGISVVGDL GVVGFPPGGA LVSFYTNFLN  
51 TIWPSDPWK AFMEQVEALM DQKIADYAKN KALAEQLGLQ NNVEDYVSA  
101 SSWQKNPVSS RNPHSQGRIR ELFSQAESHF RNSMPSEFAIS GYEVFLTTY  
151 AQAANTNLF LKDAQYIGE WGYEKEDIAE FYKRQLKLTQ EYTDHCVKWY  
201 NVGLDKLRGS SYESWVFNWR YRREMTLTVL DLIALFLYD VRLYPKEVKT  
251 ELTRDVLTD IPGVNNLRGY GTTFSENIEN IRKPHLFDYL HRIQFHTRF  
301 PGYYGNDNFSN YWNGNVSTR PSIGSNDIIT SPFYGNKSS EPVQNFENG  
351 KYVRAVANTN LAWPSAVYS GVTKEVFSQY NDQIDEASTQ TYDSKRNVGA  
401 VSWDSIDLQ PETTDEPLEK GYSHQLNVM CFLWQGSRG IPVLTWTHKS  
451 VDFENMIDSK KITQLPLVKA YKLQSGASV AGPRFTGGDI IQCTENGSA  
501 TIYVTPDVS YSQYRARIH ASTSQITFTL SLDGAPFNQY YFDKTINGGD  
551 TLTYSNFNLA SFSTPFELSG NNLIQVGTGL SAGDKVYIDK IEFIPVN

MF Unspecified

CI MAN

SR CA

LC STN Files: CA, CAPLUS, TOXCENTER

2 REFERENCES IN FILE CA (1907 TO DATE)

2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L9 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN

RN 128123-81-9 REGISTRY

CN Toxin, endo- (Bacillus thuringiensis tenebrionis plasmid clone pMON5456 parasporal crystal reduced) 2-L-

alanine-597a-L-leucine-597b-L-arginine-597c-L-serine-597d-L-proline-597e-glycine-597f-L-threonine-597g-L-

glutamicacid-597h-L-leucine-597i-L-glutamic acid-597j-L-phenylalanine-597k-L- isoleucine-597l-aspartic acid-

597m-L-isoleucine- (9Ci) (CA INDEX NAME)

FS PROTEIN SEQUENCE

SQL 610

SEQ 1 HAADHWTEAL DSSTTKDVIQ KGISVVGDL GVVGFPPGGA LVSFYTWFLW  
51 TIWPSDPWK AFMEQVEALM DQKIADYAKN KALAEQLGLQ WHVEDYVSA  
101 SSWQKNPVSS RNPHSQGRIR ELFSQAESHF RWSMPSEFAIS GYEVFLTTY  
151 AQAANTNLF LKDAQYIGE WGYEKEDIAE FYKRQLKLTQ EYTDHCVKWY  
201 WGLDKLRGS SYESWVFNWR YRREMTLTVL DLIALFLYD VRLYPKEVKT  
251 ELTRDVLTD IPGVNNLRGY GTTFSENIEN YRKPHELDY LNRIQFHTRF  
301 QPGYYGNDNFSN YWNGNVSTR PSIGSNDIIT SPFYGNKSS EPVQNFENG  
351 KYVRAVANTN LAWPSAVYS GVTKEVFSQ YMDQTDASTQ TYDSKRNVGA  
401 VSWDSIDLQ PETTDEPLEK GYSMLMYVM CFLWQGSRG IPVLTWTHKS  
451 VDFENMIDSK KITQLPLVKA YKLQSGASV AGPRFTGGDI IQCTENGSA  
501 TIYVTPDVS YSQYRARIH YASTSQITFTL SLDGAPFNQY YFDKTINGGD  
551 TLTYSNFNLA SFSTPFELSG WWLIQVGTGL SAGDKVYIDK IEFIPVHLRS  
601 PGTELEFIDI

MF Unspecified

CI MAN

SR CA

LC STN Files: CA, CAPLUS, TOXCENTER

1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L10 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN

RN 124541-32-8 REGISTRY

CN 47-644-Toxin, endo- (Bacillus thuringiensis tenebrionis parasporal crystal precursor reduced) (9Ci) (CA

INDEX NAME)

FS PROTEIN SEQUENCE

SQL 598

SEQ 1 RMTADNNTAAL DSSTTKDVI QKGISVVGDL LGVGFPPGG ALVSFYTNFL  
51 TIWPSDPWK AFMEQVEAL MDQKIADYAKN KALAEQLGLQ NNVEDYVSA  
101 SSWQKNPVSS RNPHSQGRIR ELFSQAESHF RNSMPSEFAIS GYEVFLTTY  
151 YQAANTHLF LKDAQYIGE WGYEKEDIAE EFYKRQLKLT QEYTDHCVKW  
201 YNVGLDKLRG SSYESWVFN RYRREMTLTV DLIALFLYD VRLYPKEVKT  
251 TELTRDVLTD IPGVNNLRG YGTTFSENIEN YRKPHELDY LHRIQFHTRF  
301 QPGYYGNDNFSN YWNGNVSTR PSIGSNDIIT SPFYGNKSS EPVQNFENG  
351 EKVRAVANTN LAWPSAVYS GVTKEVFSQ YNDQIDEAST QTYDSKRNVG  
401 AVSWDSIDLQ PETTDEPLE KGYSHQLNVM MCFMQGSRG TIPVLTWTHK  
451 SVDFENMIDSK KITQLPLVKA YKLQSGASV AGPRFTGGDI IQCTENGSA  
501 ATYVTPDVS YSQYRARIH YASTSQITFTL SLDGAPFNQY YFDKTINGK  
551 DLTYSNFNLA SFSTPFELSG GNNLIQVGTG LSAGDKVYIDK IEFIPVN

MF Unspecified

CI MAN

SR CA

LC STN Files: CA, CAPLUS, TOXCENTER

1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L11 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN

RN 123514-67-0 REGISTRY

CN Toxin, endo- (Bacillus thuringiensis strain EG2158 plasmid clone pEG212 parasporal crystal reduced) (9Ci)

(CA INDEX NAME)

FS PROTEIN SEQUENCE

SQL 594

SEQ 1 TEALDSSTTK DVIQKGISVW GDLLGVVGFP FGGALVSFYT NFLNTWPSE  
51 DPWKAFMEQV EALMDQKIAD YAKNKALAE QGLQNNVEDY VSALSSWQKN  
101 PVSSRNPHSQ GRIRSELFQA ESHFRNSMPS TAISGYEVLV LTTYAQAANT  
151 HLFLLLKDAQI YGEEWGYEKE DIAEFYKRQL KLTQEYTDHC VKWYNVGLDK  
201 LRSSYESWV NFNRVREMT LTVLDIALF PLYDVRLYPK EVKTELTRDV  
251 LTPDIVGNN LREYGTTFSN IENYRKPHELDY LHRIQFH TRFPQGYGN  
301 DSFNWYSGNY VSTRPSIGN DIITSPFYGN KSSGPVQNLE FNGEKYVRAY  
351 ANTNLAWPS AVYSGVTKVE FSQNDQDTE ASTQTYDSKR NVGAVSWDSI  
401 DQLPETTDE PLEKGYSHQL NYVMCFLMQG SRGTIPVLTV THKSVDFENM  
451 IDSKKITQLP LVKAYKAYKL QSGASVWAGP RFTGGDIQC TENGSAATY  
501 VTPDVSYSQK YRARIHYAST SQITFTSLD GAPFNQYFD KTINGGDTLT  
551 YNSFNLASFS TPFELSGNNL QIGVTGLSAG DKVYIDKIEF IPVN

MF Unspecified

CI MAN

SR CA

LC STN Files: CA, CAPLUS, TOXCENTER

1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L12 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 123516-40-5 REGISTRY  
CN 8-594-Toxin, endo- (Bacillus thuringiensis tenebrionis parasporal crystal reduced (9CI)) (CA INDEX NAME)  
FS PROTEIN SEQUENCE  
SQL 587

SEQ 1 DSSTTKDVIQ KGISVVGDL GVGFPFGGA LVSYFTNFLN TIWPSDPWK  
51 AFMEQVEALM DOKIADYAKN KALAELOGLQ NNVEDYVSAL SSWQKNPVSS  
101 RNPHSQGRIR ELFSQAESHF RNSMPSFAIS GYEVLFLLTY AQAANTHLFL  
151 LKDAQYIGEE WGYEKEDIAE FYKRQLKLQ EYTNHCWKWY NVGLDKLRGS  
201 SYESWVNFNR YREMTLTVL DLALFLYD VRLYPKEVKT ELTRDVLTD  
251 IGVNLRGY GTTFSNIENY IRKPHLFDYL HRIQFHTRFQ PGYYGNDSEFN  
301 YWSGNYVSTR PSIGSNDIT SPFYGNKSSE PVQNLFEFNGE KYRAVANTN  
351 LAWPSAVVYS GYTKVEFSQY NDQIDEASTQ TYDSKRNVGA VSWDSIDQLP  
401 PETTDEPLEK GYSHQLNYVM CFLMGSGRGT IPVLTWTHKS VDFENMIDSK  
451 KITQLPLVKA YKLQSGASV AGPRFTGGDI IQCTENGSAATYVTPDVSY  
501 SQKYRARIHY ASTSQITFTL SLDGAPFNQY YFDKTINKGD TLTYNSFNLA  
551 SFSTPFELSG NNLQIGVTGL SAGDKVYIDK IEFIPVN

MF Unspecified  
CI MAN  
SR CA  
LC STN Files: CA, CAPLUS, TOXCENTER  
1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L13 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 120313-97-5 REGISTRY  
CN 16-644-Toxin, endo- (Bacillus thuringiensis tenebrionis plasmid clone pMON5420/pMON5421 parasporal crystal precursor reduced) (9CI) (CA INDEX NAME)  
FS PROTEIN SEQUENCE  
SQL 629

SEQ 1 ENNEVPTNHV QYPLAETPNP TLEDNLNKEF LRMTADNNTA ALDSSTTKDV  
51 IQKGISVVGD LLGVVGFPFG GALVSFYTNF LNTIWPSDDP WKAFMEQVEA  
101 LMDQKIADYA KNIKALAELOQ LQNNVEDYVS ALSSWQKNPV SSRNPHSQGR  
151 IRELFQSAES HFRNSMPSFA ISGYEVFLFT TYAQAANTHL FLLKDAQYIG  
201 EEWGYEKEDIAEFYKRQLKL TOEYTDHCVK WYNVGLDKLR GSSYESWVNF  
251 NRYRREMTLT VLDIALFPL YDVRLYPKEV KTELTRDVLTDPIVGVNLR  
301 GYGTTFESNIE NYIRKPHLFD YLHRIQFTR FQPGYYGNDN FNYWSGNYVS  
351 TRPSIGSNDI ITSPFYGNKS SEPQVQNLFEFN GEKVYRAVAN TNLAVWPSAV  
401 YSGVTKVEFS QYNDQIDEAS TQTYDSKRNV GAVSWDSIDQLP PETTDEPL  
451 EKGYSHELNY VMCFLMQGSR GTIPVLTWTH KSVDFENMID SKKITQLPLV  
501 KAYKLQSGAS WAGPRFTGG DIQCTENGSAATYVTPDV SYSQKYRARI  
551 HYASTSQITF TSLSDGAPFN QYYFDKTINK GDTLTYSNFN LASFSTPFEL  
601 SGNNLQIGVT GLSAGDKVYIDKIEFIPVN

MF Unspecified  
CI MAN  
SR CA  
LC STN Files: CA, CAPLUS, TOXCENTER, USPATFULL  
1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L14 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 112659-37-7 REGISTRY  
CN Toxin, endo- (Bacillus thuringiensis tenebrionis parasporal crystal precursor reduced) (9CI) (CA INDEX NAME)  
FS PROTEIN SEQUENCE  
SQL 643

SEQ 1 MNPNNRSEHD TIKTTENNEV PTNHVQYPLA ETPNPTLEDL NYKEFLRMTA  
51 DNNTAELDSS TTKDVIQKGI SVVGDLGGV GPFPGGALVS FYTNFLNTIW  
101 PSEDWPWKAFF EQVEALMDQK IADYAKNKAL AELQGLQNNV EDYVSALSSW  
151 QKNPVSSRNP HSQGRIRSELF SQAESHFRNS MPFSAISGYE VLFLTTYAQA  
201 ANTHLFLKLD AQYIGEEWGY EKEDIAEFYK RQLKLTQEYT DHCVKWYNVG  
251 LDKLRGSSYE SWVNFNRYRR EMTLTVLDLI ALFPLYDVRL YPKEVKTELT  
301 RDVLTDPIVG VNNLRGYGT FSNENYIRKP HLFDYLHRIQ FHTRFQPGY  
351 GNDSEFNWSG NYVSTRPSIG SNDIITSPFY GNKSSEPQVN LEFNGEKVYR  
401 AVANTNLAVW PSAYSGVT KVEFSQYNDQT DEASTQTYDS KRNVGAVSWD  
451 SIDQLPETT DEPLEKGYSH QLNYVMCFLM QGSRGTIPVL TWTHKSVDF  
501 NMIDSKKITQ LPLVKAYKLQ SGASVAVGPR FTGGDIQCT ENGSAATYV  
551 TPDVSYSQKY RARIHYASTS QITFTLSLDG APFNQYYFDK TINKGDTLTY  
601 NSFNLASFST PFELSGNNLQ IGVGTLSAGD KVIYDKIEFI PVN

MF Unspecified  
CI MAN  
SR CA  
LC STN Files: CA, CAPLUS, TOXCENTER  
2 REFERENCES IN FILE CA (1907 TO DATE)  
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L15 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2004 ACS on STN  
RN 112659-38-8 REGISTRY  
CN Toxin, endo- (Bacillus thuringiensis tenebrionis parasporal crystal reduced) (9CI) (CA INDEX NAME)  
FS PROTEIN SEQUENCE  
SQL 594

SEQ 1 DNNTAELDSS TTKDVIQKGI SVVGDLGGV GPFPGGALVS FYTNFLNTIW  
51 PSEDWPWKAFF EQVEALMDQK IADYAKNKAL AELQGLQNNV EDYVSALSSW  
101 QKNPVSSRNP HSQGRIRSELF SQAESHFRNS MPFSAISGYE VLFLTTYAQA  
151 ANTHLFLKLD AQYIGEEWGY EKEDIAEFYK RQLKLTQEYT DHCVKWYNVG  
201 LDKLRGSSYE SWVNFNRYRR EMTLTVLDLI ALFPLYDVRL YPKEVKTELT  
251 RDVLTDPIVG VNNLRGYGT FSNENYIRK PHLFDYLHRI QHTRFQPGY  
301 YGNDSEFNWS GNVSTRPSI GSNDIITSPF YGNKSSEPQV NLEFNGEKY  
351 RAVANTNLAV WPSAVSGVT KVEFSQYNDQ TDEASTQTYD SKRNVGAVSW  
401 DSIDLPPET TDEPLEKGYSH QLNYVMCFLM MQSGRGTIPV LTWTHKSVDF  
451 NMIDSKKIT QPLVKAYKL QSGASVAVGPR FTGGDIQCT TENGSAATY  
501 VTPDVSYSQK YRARIHYAST SQITFTLSLDG APFNQYYFD KINKGDTLTY  
551 YNSFNLASFS TPFELSGNNL QIGVTLSAGD DKVIYDKIEFI PVN

MF Unspecified  
CI MAN  
SR CA  
LC STN Files: CA, CAPLUS, TOXCENTER  
1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

Set	Items	Description
S1	3029	THURINGIENSIS
S2	53940	TOXIN
S3	721	S1 AND S2
S4	56124	PROTEOL?
S5	72	S3 AND S4
S6	98699	FRAGMENT
S7	52	S3 AND S6
S8	43	S7 NOT S5

- 5/6/19 12914090 PMID: 8568902 Functional significance of loops in the receptor binding domain of *Bacillus thuringiensis* CryIIIA delta-endotoxin. Feb 2 1996
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- 5/6/22 12645485 PMID: 7770056 Mapping and characterization of the entomocidal domain of the *Bacillus thuringiensis* CryI(Ab) protoxin May 20 1995
- 5/6/23 12469757 PMID: 12902253 The mode of action of the *Bacillus thuringiensis* vegetative insecticidal protein Vip3A differs from that of Cry/Ab delta-endotoxin. Aug 2003
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- 56/60 08262992 PMID: 2549968 Proteolytic processing of a coleopteran-specific delta-endotoxin produced by *Bacillus thuringiensis* var. tenebrionis. Jul 1 1989
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- The conformational characteristics of the minimal toxic fragment of the delta-endotoxin from *Bacillus thuringiensis* berliner 1715 were examined by fluorescence and circular dichroism spectroscopy. This insecticidal protein, specifically toxic to lepidopteran species, was found to consist of two structural domains. Experimental evidence for this conclusion was provided by biphasic guanidine hydrochloride unfolding curves at different pH values and electrophoretic patterns of protease digest. Two stable fragments of comparable molecular weight were obtained using four different broad specificity proteolytic enzymes. A secondary structure model was constructed using seven *B. thuringiensis* toxin sequences. These toxins were selected on the basis of their limited sequence homology and represent all known insecticidal specificities. Despite this divergence, a consensus secondary structure pattern was obtained, confirming the structural homology among the toxin. The N-terminal halves of all toxins are predicted to be relatively rich in alpha-helix structure and the C-terminal parts to contain alternating beta-strand and coil structures. The latter seems characteristic for a beta-sheet conformation. Comparing model to the unfolding data obtained by circular dichroism, whose far UV signal gives a measure of the alpha-helix content allowed us to delineate the structural domains into the primary structure. Record Date Created: 19900221 Record Date Completed: 19900221
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- 08262992 PMID: 2549968 Proteolytic processing of a coleopteran-specific delta-endotoxin produced by *Bacillus thuringiensis* var. tenebrionis. Carroll J; Li J; Ellar D J Department of Biochemistry, University of Cambridge, U.K. Biochemical journal (ENGLAND) Jul 1 1989, 261 (1) p99-105, ISSN 0264-6021 Journal Code: 2984726R Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed
- Insecticidal protein delta-endotoxin crystals harvested from sporulated cultures of *Bacillus thuringiensis* var. tenebrionis contain a major polypeptide of 67 kDa and minor polypeptides of 73, 72, 55 and 46 kDa. During sporulation, only the 73 kDa polypeptide could be detected at stage I. The 67 kDa polypeptide was first detected at stage II and increased in concentration throughout the later stages of sporulation and after crystal release, with a concomitant decrease in the 73 kDa polypeptide. The change could be blocked by the addition of proteinase inhibitors. Trypsin or insect-gut-tract treatment of the delta-endotoxin crystals after solubilization resulted in a cleavage product of 55 kDa with asparagine-159 of the deduced amino acid sequence of the toxin [Hofte, Seurinck, van Houtven & Vaecq (1987) Nucleic Acids Res. 15, 71-83; Sekar, Thompson Maroney, Bookland & Adang (1987) Proc. Natl. Acad. Sci. U.S.A. 84, 7036-7040; McPherson, Penak, Fuchs, Marrone Lavrik & Fischhoff (1988) Biotechnology 6, 61-66] at the N-terminus. This polypeptide was found to be as toxic in vivo as native delta-endotoxin. Record Date Created: 19890927 Record Date Completed: 19890927
- 57/69 DIALOG(R)/File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.
- 07012872 PMID: 3909962 Protease activation of the entomotoxin protoxin of *Bacillus thuringiensis* subsp. kurstaki. Andrews R E; Biblos M M; Bulla L A Applied and environmental microbiology (UNITED STATES) Oct 1985, 50 (4) p373-42, ISSN 0099-2240 Journal Code: 7605801 Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed



Two isolates of *Bacillus thuringiensis* subsp. *kurstaki* were examined which produced different levels of intracellular proteases. Although the crystals from both strains had comparable toxicity, one of the strains, LB1, had a strong polypeptide band at 68,000 molecular weight in the protein from the crystal; in the other, HD251, no such band was evident. When the intracellular proteases in both strains were measured, strain HD251 produced less than 10% of the proteolytic activity found in LB1. These proteases were primarily neutral metalloproteases, although low levels of other proteases were detected. In LB1, the synthesis of protease increased as the cells began to sporulate; however, in HD251, protease activity appeared much later in the sporulation cycle. The protease activity in strain LB1 was very high when the cells were making crystal toxin, whereas in HD251 reduced proteolytic activity was present during crystal toxin synthesis. The insecticidal toxin (molecular weight, 68,000) from both strains could be prepared by cleaving the protoxin (molecular weight, 135,000) with trypsin, followed by ion-exchange chromatography. The procedure described gave quantitative recovery of toxic activity, and approximately half of the total protein was recovered. Calculations show that these results correspond to stoichiometric conversion of protoxin to insecticidal toxin. The toxicities of whole crystals, soluble crystal protein, and purified toxin from both strains were comparable. Record Date Created: 19860130 Record Date Completed: 19860130

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07102416 PMID: 3009187

Specificity of *Bacillus thuringiensis* var. *colimae* insecticidal delta-endotoxin is determined by differential proteolytic processing of the protoxin by larval gut proteases.

Haider M Z; Knowles B H; Ellar D J

European journal of biochemistry / FEBS (GERMANY, WEST) May 2 1986; 156 (3) p531-40, ISSN 0014-2956 Journal Code: 0107600 Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed The native crystal delta-endotoxin produced by *Bacillus thuringiensis* var. *colimae*, serotype 21, is toxic to both lepidopteran (Pieris brassicae) and dipteran (*Aedes aegypti*) larvae. Solubilization of the crystal delta-endotoxin in alkaline reducing conditions and activation with trypsin and gut extracts from susceptible insects yielded a preparation whose toxicity could be assayed *in vitro* against a range of insect cell lines. After activation with *Aedes aegypti* gut extract the preparation was toxic to all of the mosquito cell lines but only one lepidopteran line (*Spodoptera frugiperda*), whereas an activated preparation produced by treatment with *P. brassicae* gut enzymes or trypsin was toxic only to lepidopteran cell lines. These *in vitro* results were paralleled by the results of *in vivo* bioassays. Gel electrophoretic analysis of the products of these different activation regimes suggested that a 130-kDa protoxin in the native crystal is converted to a 55-kDa lepidopteran-specific toxin by trypsin or *P. brassicae* enzymes and to a 52-kDa dipteran toxin by *A. aegypti* enzymes. Two-step activation of the 130-kDa protoxin by successive treatment with trypsin and *A. aegypti* enzymes further suggested that the 52-kDa dipteran toxin is derived from the 55-kDa lepidopteran toxin by enzymes specific to the mosquito gut. Confirmation of this suggestion was obtained by peptide mapping of these two polypeptides. The native crystal 130 kDa delta-endotoxin and the two insect-specific toxins all cross-reacted with antiserum to *B. thuringiensis* var. *kurstaki* P1 lepidopteran toxin. Preincubation of the two activated colimae toxins with P1 antiserum neutralized their cytotoxicity to both lepidopteran and dipteran cell lines. Record Date Created: 19860618 Record Date Completed: 19860618

57/770 DIALOG(R)/File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.

06813876 PMID: 3888979

Delineation of a toxin-encoding segment of a *Bacillus thuringiensis* crystal protein gene.

Schnepf H E; Whiteley H R

Journal of biological chemistry (UNITED STATES) May 25 1985; 260 (10) p6273-80, ISSN 0021-9258 Journal Code: 2985121R Contract/Grant No.: GM-20784; GM; NIGMS; GM-26100; GM; NIGMS; K6-GM-442; GM; NIGMS Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed

Crystals of *Bacillus thuringiensis* subsp. *kurstaki* HD-1-Dipel contain a Mr 134,000 protoxin which can be cleaved by proteolysis to a peptide of Mr approximately 70,000; this peptide is lethal to lepidopteran larvae. We have analyzed the peptides produced by recombinant *Escherichia coli* strains bearing deletions and fusions of the protoxin gene in order to delineate the portion of the gene which encodes the toxic peptide. The recombinant strains produced the toxic peptide as well as larger peptides whose size was related to the length of the deleted gene. The results indicate that the amino-terminal 55% of the protoxin protein is sufficient for toxicity. While two different gene fusions to the 10th codon allowed the synthesis of toxic polypeptides, fusions to the 50th codon did not. 3' end deletions up to the 645th codon allowed synthesis of the toxic polypeptide whereas a deletion to the 603rd codon yielded a non-toxic peptide. Some of the 5' and 3' end alterations to the gene caused changes in the proteolytic cleavage patterns of the polypeptides synthesized by *E. coli*, suggesting that the alterations led to conformational changes in the proteins. The presence of different 3' end segments affected the levels of synthesis of the altered crystal proteins. Record Date Created: 19850627 Record Date Completed: 19850627

57/771 DIALOG(R)/File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.  
06465876 PMID: 6321329

Specificity of cultured insect tissue cells for bioassay of entomocidal protein from *Bacillus thuringiensis*.  
Johnson D E; Davidson L I

*In vitro* (UNITED STATES) Jan 1984; 20 (1) p66-70, ISSN 0073-5655 Journal Code: 0063733 Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed

Cultured tissue cells from lepidopteran and dipteran sources displayed an order-specific response to entomocidal protein from crystals of *Bacillus thuringiensis*. Protein isolated from crystals of *B. thuringiensis* subsp. *kurstaki* (Manduca sexta) but was against cells of the spruce budworm (*Choristoneura fumiferana*) and the tobacco hornworm (*Manduca sexta*) but was inactive against both mosquito cell lines tested (*Aedes aegypti* and *Anopheles gambiae*). Conversely, protein from inclusions of *B. thuringiensis* subsp. *israelensis* was fully active only against the mosquito cell lines but displayed reduced (four- to seven-fold) toxicity for the lepidopteran cell lines. One exception to this pattern of specificity was observed with *Plodia interpunctella* cell line, which failed to respond to either crystal protein preparation. The moth toxin was stable at degrees C for months, whereas the mosquito toxin was susceptible to proteolytic degradation and was unstable for periods longer than 2 wk. Record Date Created: 19840419 Record Date Completed: 19840419

57/772 DIALOG(R)/File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.  
05398675 PMID: 7420053

Purification of the insecticidal toxin in crystals of *Bacillus thuringiensis*.

Lilley M; Ruffell R N; Somerville H J

Journal of general microbiology (ENGLAND) May 1980; 118 (Pt 1) p1-11, ISSN 0022-1287 Journal Code: 0375371 Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed

Crystals were purified from four serotypes of the insect pathogen *Bacillus thuringiensis*. Crystals from these serotypes were similar in amino acid and N-terminal analyses, but differed in their toxicity to two species of Lepidoptera and in their immunological properties. Toxic polypeptides were obtained following trypsin digestion of solutions of the crystals. In two strains (serotypes 3 and 9) this fraction contained only one polypeptide. Similar results were obtained when dissolved crystals were digested with other proteolytic enzymes or with gut contents from Pieris brassicae. The trypsin-resistant polypeptide was further purified by gel and ion-exchange chromatography and had a molecular weight of about 70,000, estimated by gel chromatography and gel electrophoresis. No evidence was obtained for a toxin of lower molecular weight. This purified toxin accounted for most, if not all, of the toxic activity originally present in the crystal solution and was active by injection and ingestion. The purified toxic fraction from serotype 1 appeared to contain two polypeptides, one of which corresponded to that found with serotypes 3 and 9. There were no major differences in the composition of crystals from different serotypes of *B. thuringiensis* and it is concluded that the trypsin-resistant polypeptide represents the active insecticidal toxin of the crystal. Record Date Created: 19801218 Record Date Completed: 19801218

8/6/1 15683588 PMID: 14668140

Ion channels formed in planar lipid bilayers by the dipteran-specific Cry4B *Bacillus thuringiensis* toxin and its alpha1-alpha5 fragment. Ja Feb 2004

8/6/2 15013850 PMID: 12555398

Cloning and expression of the binary toxin genes of *Bacillus sphaericus* C3-41 in a crystal minus *B. thuringiensis* subsp. *israelensis* Feb 199

8/6/3 14510132 PMID: 10508095

Production of chymotrypsin-resistant *Bacillus thuringiensis* Cry2Aa1 delta-endotoxin by protein engineering. Oct 1999

8/6/4 14485285 PMID: 10481060

Amino acid substitution in alpha-helix 7 of Cry1Ac delta-endotoxin of *Bacillus thuringiensis* leads to enhanced toxicity to *Helicoverpa armigera* Hubner. Sep 17 1999

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*Bacillus thuringiensis* insecticidal Cry1Aa toxin binds to a highly conserved region of aminopeptidase N in the host insect leading to its evolutionary success. Jun 15 1999

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The introduction into *Bacillus sphaericus* of the *Bacillus thuringiensis* subsp. *medellin* Cry1Ab1 gene results in higher susceptibility of resistant mosquito larva populations to *B. sphaericus*. Oct 1998

8/6/7 14040117 PMID: 9739466

Biochemical characterization of the third domain from *Bacillus thuringiensis* Cry1A toxins. Aug 1998

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Cloning and characterization of *Manduca sexta* and *Plutella xylostella* midgut aminopeptidase N enzymes related to *Bacillus thuringiensis* toxin-binding proteins. Sep 15 1997

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Cloning, expression and toxicity of a mosquitoicidal toxin gene of *Bacillus thuringiensis* subsp. *medellin*. Mar-Apr 1997

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Isolated domain II and III from the *Bacillus thuringiensis* Cry1Ab delta-endotoxin binds to lepidopteran midgut membranes. Sep 8 1997

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Thermodynamic analysis of domain organization of *Bacillus thuringiensis* toxins] Termodinamicheskie analiz domennoi organizatsii toksinov *Bacillus thuringiensis*. Dec 1996
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The insecticidal CryIIb crystal protein of *Bacillus thuringiensis* ssp. *thuringiensis* has dual specificity to coleopteran and lepidopteran larvae. Mar 1995
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Expression in *Pichia pastoris* and purification of a membrane-acting immunotoxin based on a synthetic gene coding for the *Bacillus thuringiensis* Cyt2Aa1 toxin. May 2003
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Enterotoxigenicity and cytotoxicity of *Bacillus thuringiensis* strains and development of a process for Cyt1Ac production. Jan 1 2003
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Heterologous expression of cry2 gene from a local strain of *Bacillus thuringiensis* isolated in Nigeria. Dec 2002
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Cloning and characterization of an insecticidal crystal protein gene from *Bacillus thuringiensis* subspecies *kenyae*. Apr 2002
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Cry1A toxins of *Bacillus thuringiensis* bind specifically to a region adjacent to the membrane-proximal extracellular domain of BT-R(1) in *Manduca sexta*: involvement of a cadherin in the entomopathogenicity of *Bacillus thuringiensis*. Sep 2002
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Physical mapping of the *Bacillus thuringiensis* subsp. *kurstaki* and *alesti* chromosomes. Feb 2002
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Processing of CryIAb delta-endotoxin from *Bacillus thuringiensis* by *Manduca sexta* and *Spodoptera frugiperda* midgut proteases: role in protoxin activation and toxin inactivation. Nov 1 2001
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Characterization of a *Bacillus thuringiensis* delta-endotoxin which is toxic to insects in three orders. Aug 2000
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Comparative insecticidal properties of two nucleopolyhedrovirus vectors encoding a similar toxin gene chimera. Aug 2000
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Genome stability of *Bacillus thuringiensis* subsp. *israelensis* isolates. Jan 2000
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Insect-resistant chrysanthemum calluses by introduction of a *Bacillus thuringiensis* crystal protein gene. May 1993
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Genomic amplification and expression of delta-endotoxin fragment of *Bacillus thuringiensis*. Sep 16 1992
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Expansion of insecticidal host range of *Bacillus thuringiensis* by in vivo genetic recombination. Apr 1992
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Two structural domains as a general fold of the toxic fragment of the *Bacillus thuringiensis* delta-endotoxins. Feb 14 1991
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Molecular cloning of the 130-kilodalton mesquitocidal delta-endotoxin gene of *Bacillus thuringiensis* subsp. *israelensis* in *Bacillus sphaericus*. Jun 1990
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Heterologous expression of a mutated toxin gene from *Bacillus thuringiensis* subsp. *tenebrionis*. Jan 1 1990
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Gene dosage effect on the expression of the delta-endotoxin genes of *Bacillus thuringiensis* subsp. *kurstaki* in *Bacillus subtilis* and *Bacillus megaterium*. Jun 30 1989
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Involvement of Trn4430 in transfer of *Bacillus anthracis* plasmids mediated by *Bacillus thuringiensis* plasmid pXO12. Jan 1989
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The mosquito larvicidal activity of 130 kDa delta-endotoxin of *Bacillus thuringiensis* var. *israelensis* resides in the 72 kDa amino-terminal fragment. May 31 1988
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Common features of *Bacillus thuringiensis* toxins specific for Diptera and Lepidoptera. Apr 5 1988
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Cloning and heterologous expression of an insecticidal delta-endotoxin gene from *Bacillus thuringiensis* var. *aizawai* IC1 toxic to both lepidoptera and diptera. 1987
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Purification and characterization of the active fragment from *Bacillus thuringiensis* delta-toxin. Nov 26 1986
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*Bacillus thuringiensis* var. *israelensis* delta-endotoxin. Nucleotide sequence and characterization of the transcripts in *Bacillus thuringiensis* and *Escherichia coli*. Sep 5 1986
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Cloning and expression of the lepidopteran toxin produced by *Bacillus thuringiensis* var. *thuringiensis* in *Escherichia coli*. 1986
- 8/6/43 06615870 PMID: 6090216  
Cloning and expression in *Escherichia coli* of the insecticidal delta-endotoxin gene of *Bacillus thuringiensis* var. *israelensis*. Oct 1 1984
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*Bacillus thuringiensis* var. *israelensis* delta-endotoxin. Nucleotide sequence and characterization of the transcripts in *Bacillus thuringiensis* and *Escherichia coli*.  
Ward E S; Ellar D J  
Journal of molecular biology (ENGLAND) Sep 5 1986; 191 (1) p1-11, ISSN 0022-2836 Journal Code: 2985088R  
Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed  
The nucleotide sequence of a 1408 base-pair DNA fragment encoding the insecticidal 27,340 Mr delta-endotoxin of *Bacillus thuringiensis* var. *israelensis* has been determined by analysis of a recombinant plasmid from *Escherichia coli*. The hydrophathy plot of the protein shows it to be highly hydrophobic, consistent with a postulated cytolytic mechanism of action for the toxin. In addition, the delta-endotoxin transcriptional start points that are used in *B. thuringiensis* and an *E. coli* recombinant have been determined. In *B. thuringiensis* var. *israelensis*, transcription initiates from a single start point, and gene-specific transcripts are not observed before stage II of sporulation. This is the stage at which delta-endotoxin antigen is first detected, indicating that control of expression is primarily at the transcriptional level for this protein. Analysis of gene-specific transcription in *E. coli* indicates that at least three start points are utilized in this organism. Interestingly, the highest level of delta-endotoxin mRNA is seen during mid-exponential growth of *E. coli* and the level appears to decrease as the cells enter the stationary phase of growth. Record Date Created: 19870123 Record Date Completed: 19870123
- 8/7/42 DIALOG(R)File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.  
07158027 PMID: 3013729  
Cloning and expression of the lepidopteran toxin produced by *Bacillus thuringiensis* var. *thuringiensis* in *Escherichia coli*.  
Honigman A; Nedjar-Pazemli G; Yawetz A; Oron U; Schuster S; Broza M; Sneh B  
Gene (NETHERLANDS) 1986; 42 (1) p69-77, ISSN 0378-1119 Journal Code: 7706761 Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed  
The *Bacillus thuringiensis* var. *thuringiensis* strain 3A produces a proteinaceous parasporal crystal toxic to larvae of a variety of lepidopteran pests including *Spodoptera littoralis* (Egyptian cotton leaf worm), *Heliothis zea*, *H. virescens* and *Boarmia selenaria*. By cloning of individual plasmids of *B. thuringiensis* in *Escherichia coli*, we localized a gene coding for the delta-endotoxin on the *B. thuringiensis* plasmid of about 17 kb designated pTN4. Following partial digestion of the

thuringiensis plasmid pTM4 and cloning into the E. coli pACYC184 plasmid three clones were isolated in which toxin production was detected. One of these hybrid plasmids pTNG43 carried a 1.7-kb insert that hybridized to the 14-kb BamHI DNA fragments of B. thuringiensis var. thuringiensis strains 3A and berliner 1715. This BamHI DNA fragment of strain berliner 1715 has been shown to contain the gene that codes for the toxic protein of the crystal (Klier et al., 1982). No homologous sequences have been found between pTNG33 and the DNA of B. thuringiensis var. entomocidus strain 24, which exhibited insecticidal activity against S. littoralis similar to that of strain 3A. Record Date Created: 19860725 Record Date Completed: 19860725

87/43 DIALOG(R)File 155:MEDLINE(R) (c) format only 2004 The Dialog Corp. All rts. reserv.

06615870 PMID: 6090216

Cloning and expression in Escherichia coli of the insecticidal delta-endotoxin gene of Bacillus thuringiensis var. israelensis. Ward E S; Elar D J; Todd J A

FEBS letters (NETHERLANDS) Oct 1 1984, 175 (2), p377-82, ISSN 0014-5793 Journal Code: 0155157

Document type: Journal Article Languages: ENGLISH Main Citation Owner: NLM Record type: Completed

Recombinant plasmids containing the mosquitocidal delta-endotoxin gene were constructed by inserting HindIII fragments of the Bacillus thuringiensis var. israelensis 72.75 Md plasmid in to the Escherichia coli vector pUC12. Two

recombinants producing the 26 000 Da delta-endotoxin (pIP173 and pIP174) were identified by screening clones in an E. coli in vitro transcription-translation system. Both recombinants were 12.4 kb chimaeric plasmids comprising pUC12 and a common 9.7 kb HindIII fragment of the B. thuringiensis plasmid. The 26 000 Da polypeptide synthesis in vivo from pIP174

transformed into E. coli JM101 was lethal to mosquito larvae and cytotoxic to mosquito cells in vitro. The biological authenticity of the cloned product was further confirmed by demonstrating that the cytotoxicity of the polypeptide was

neutralised by antiserum to the authentic delta-endotoxin or by preincubation with excess toxin receptor. Transcription of the recombinant delta-endotoxin gene in E. coli appears to utilise a Bacillus promoter sequence(s) rather than the pUC12 beta-galactosidase promoter. Record Date Created: 19841119 Record Date Completed: 19841119

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Set Items Description

S1 8862 THURINGIENSIS

S2 141509 TOXIN

S3 1859 S1 AND S2

S4 67863 PROTEOL?

S5 94 S3 AND S4

S6 113606 FRAGMENT

S7 84 S3 AND S6

S8 73 S7 NOT S5

5/6/1

0014628028 BIOSIS NO.: 2003000578705

Role of proteolysis in determining potency of Bacillus thuringiensis Cry1Ac delta-endotoxin.

2000

5/6/2 0014531207 BIOSIS NO.: 200300488864

The mode of action of the Bacillus thuringiensis vegetative insecticidal protein Vip3A differs from that of Cry1Ab delta-endotoxin. 2003

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Mutation of the hydrophobic residue on helix alpha5 of the Bacillus thuringiensis Cry4B affects structural stability. 2003

5/6/4 0014447768 BIOSIS NO.: 200300405487

Activity of free and clay-bound insecticidal proteins from Bacillus thuringiensis subsp. israelensis against the mosquito Culex pipiens. 2003

5/6/5 0014194705 BIOSIS NO.: 200300153424

Characterization and comparison of midgut proteases of Bacillus thuringiensis susceptible and resistant diamondback moth (Plutellidae: Lepidoptera). 2003

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Mode of action of Cry toxins from Bacillus thuringiensis. ] ORIGINAL LANGUAGE TITLE: Mecanismo de accion de las toxinas Cry de Bacillus thuringiensis. 2002

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Production of delta-endotoxin by Bacillus thuringiensis subsp kurstaki and overcoming of catabolite repression by using highly concentrated gruel and fish meal media in 2- and 20-dm3 fermenters 2002

5/6/8 0013834530 BIOSIS NO.: 200200428041

N-terminal activation is an essential early step in the mechanism of action of the Bacillus thuringiensis Cry1Ac insecticidal toxin 2002

5/6/9 0013811889 BIOSIS NO.: 200200405400

Characterization of the proteolytic enzymes in the midgut of the European Cockchafer, Melolontha melolontha (Coleoptera: Scarabaeidae) 20

5/6/10 0013798038 BIOSIS NO.: 200200391549

Interaction of 6S- and 62-kD proteins from the apical membranes of the Aedes aegypti larvae midgut epithelium with Cry4B and Cry11A ndolo of Bacillus thuringiensis 2002

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Changes in protease activity and Cry3Aa toxin binding in the Colorado potato beetle: Implications for insect resistance to Bacillus thuringiensis toxins 2002

5/6/12 0013557352 BIOSIS NO.: 200200250863

Cadherin-like receptor binding facilitates proteolytic cleavage of helix alpha-1 in domain I and oligomer pre-pore formation of Bacillus thuringiensis Cry1Ab toxin 2002

5/6/13 0013529422 BIOSIS NO.: 200200222933

Colorado potato beetle resistance to the Cry3A toxin of Bacillus thuringiensis subsp. Tenebrionis 2001

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Bacillus thuringiensis - An insecticide. ] ORIGINAL LANGUAGE TITLE: Bacillus thuringiensis : W zwalczaniu owadow 2001

5/6/15 0013395843 BIOSIS NO.: 200100567682

Transcriptional activator PlcR regulate the expression of multiple genes in Bacillus cereus 2001

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Role of interdomain salt bridges in the pore-forming ability of the Bacillus thuringiensis toxins Cry1Aa and Cry1Ac 2001

5/6/17 0013074836 BIOSIS NO.: 200100246675

Specific cleavage of the Cry1Ab toxin receptor BT-R1 in the midgut epithelium of Manduca sexta 2001

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Redesign of an interhelical loop of the Bacillus thuringiensis Cry4B delta-endotoxin for: proteolytic cleavage 2001

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Membrane pore architecture of a cytolytic toxin from Bacillus thuringiensis 2000

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Proteolytic processing of the Cyt1Ab1 toxin produced by Bacillus thuringiensis subsp. Medellin 2000

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Activation pattern and toxicity of the Cry11Bb1 toxin of Bacillus thuringiensis subsp. Medellin 2000

5/6/22 0012536933 BIOSIS NO.: 200000355246

The interactions between soybean trypsin inhibitor and delta-endotoxin of Bacillus thuringiensis in Helicoverpa armigera larva 2000

5/6/23 0012585368 BIOSIS NO.: 200000304681

Methanol-induced conformational changes in delta-endotoxin from Bacillus thuringiensis var. tenebrionis 2000

5/6/24 0012403218 BIOSIS NO.: 200000121531

Identification and purification of the 69-kDa intracellular protease involved in the proteolytic processing of the crystal delta-endotoxin of Bacillus thuringiensis subsp. Tenebrionis 2000

5/6/25 0012293594 BIOSIS NO.: 200000011907

Activation and fragmentation of Bacillus thuringiensis delta-endotoxin by high concentrations of proteolytic enzymes 1999

5/6/26 0012193125 BIOSIS NO.: 199900452785

Resistance to Bacillus thuringiensis Cry1Ac toxin in three strains of Heliothis virescens: Proteolytic and SEM study of the larval midgut 1999

5/6/27 0012001532 BIOSIS NO.: 199900261192

Intragastric and intraperitoneal administration of Cry1Ac protoxin from Bacillus thuringiensis induces systemic and mucosal antibody response in mice 1999

5/6/28 0011911540 BIOSIS NO.: 199900171200

Biochemical characterization of Bacillus thuringiensis cytolytic toxins in association with a phospholipid bilayer 1999

5/6/29 0011577763 BIOSIS NO.: 199800372010

Processing of delta-endotoxin of *Bacillus thuringiensis* subsp. *kurstaki* HD-1 in *Heliothis armigera* midgut juice and the effects of protease inhibitors 1998

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Proteolysis of *Bacillus thuringiensis* subspecies *kurstaki* endotoxin with midgut proteases of some important lepidopterous species 1998

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Involvement of an endogenous metalloprotease in the activation of protoxin in *Bacillus thuringiensis* subsp. *kurstaki* 1997

5/6/32 0011427813 BIOSIS NO.: 199800222060

Role of DNA in the activation of the Cry IA insecticidal crystal protein from *Bacillus thuringiensis* 1998

5/6/33 0011348996 BIOSIS NO.: 199800143243

Unusual proteolytic processing of a delta-endotoxin from *Bacillus thuringiensis* strain *bubui* by larval midgut juice of *Anomala cuprea* Hope (Coleoptera: Scarabaeidae) 1997

5/6/34 0011325296 BIOSIS NO.: 199800119543

Endogenous protease-activated 66-kDa toxin from *Bacillus thuringiensis* subsp. *kurstaki* active against *Spodoptera littoralis* 1998

5/6/35 0011218831 BIOSIS NO.: 199800013078

Interaction of the delta-endotoxin CytA from *Bacillus thuringiensis* var. *israelensis* with lipid membranes 1997

5/6/360011128842 BIOSIS NO.: 199799762902

Further characterization of BT-R-1, the cadherin-like receptor for CryIAb toxin in tobacco hornworm (*Manduca sexta*) midguts 1997

5/6/37 0011032606 BIOSIS NO.: 199799666666

Intramolecular proteolytic cleavage of *Bacillus thuringiensis* Cry3A delta-endotoxin may facilitate its coleopteran toxicity 1997

5/6/38 0010985883 BIOSIS NO.: 199799619943

Correction of PREVIEWS 99342806. Mapping of the entomocidal fragment of *Spodoptera*-specific *Bacillus thuringiensis* toxin CryIC. Correction of author name from Z. Konez-Kalman. Erratum published in Molecular and General Genetics Vol. 253, Iss. 6, 1997, p. 777-1996

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Channel activity caused by a *Bacillus thuringiensis* delta-endotoxin preparation depends on the method of activation 1997

5/6/400010708746 BIOSIS NO.: 199799342806

Mapping of the entomocidal fragment of *Spodoptera*-specific *Bacillus thuringiensis* toxin CryIC 1996

5/6/41 0010561121 BIOSIS NO.: 199699195181

Membrane permeabilization induced by cytolytic delta-endotoxin CytA from *Bacillus thuringiensis* var. *israelensis* 1996

5/6/42 0010469927 BIOSIS NO.: 199699103987

The effect of *Bacillus thuringiensis* M-toxin on trematode cercariae 1996

5/6/43 0010421833 BIOSIS NO.: 199699055893

Digestion of delta-endotoxin by gut proteases may explain reduced sensitivity of advanced instar larvae of *Spodoptera littoralis* to CryIC 1996

5/6/44 0010403082 BIOSIS NO.: 199699037142

Proteolytic processing of *Bacillus thuringiensis* CryIIIA toxin and specific binding to brush-border membrane vesicles of *Lepidodarsa decemlineata* (Colorado potato beetle) 1996

5/6/45 0010354486 BIOSIS NO.: 199698822319

Efficient synthesis of mosquitoicidal toxins in *Aspicacaulis excentricus* demonstrates potential of gram-negative bacteria in mosquito control 1996

5/6/460010281779 BIOSIS NO.: 199698749612

Structure of the mosquitoicidal delta-endotoxin CytB from *Bacillus thuringiensis* sp. *kyushuensis* and implications for membrane pore formation 1996

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Differences in the midgut proteolytic activity of two *Heliothis virescens* strains, one susceptible and one resistant to *Bacillus thuringiensis* toxins 1996

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Mosquitoicidal activity of the CryIC delta-endotoxin from *Bacillus thuringiensis* subsp. *Aizawai* 1996

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Functional significance of loops in the receptor binding domain of *Bacillus thuringiensis* CryIIIA delta-endotoxin 1996

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A protein complex from *Choristoneura fumiferana* gut juice involved in the precipitation of delta-endotoxin from *Bacillus thuringiensis* subsp. *Sotto* 1995

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The use of *Bacillus thuringiensis* in crop protection and the development of pest resistance 1995

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Maximal toxicity of cloned CytA delta-endotoxin from *Bacillus thuringiensis* subsp. *israelensis* requires proteolytic processing from both the N and C-termini 1995

5/6/53 0009891092 BIOSIS NO.: 199698358925

Mapping and characterization of the entomocidal domain of the *Bacillus thuringiensis* CryIA(b) protoxin 1995

5/6/54 0009708719 BIOSIS NO.: 199598176552

Production of multiple delta-endotoxins by *Bacillus thuringiensis*: delta-endotoxins produced by strains of the subspecies *galleriae* and *wuhanensis* 1994

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Expression of the insecticidal crystal protein gene from a Gram-positive *Bacillus thuringiensis* in a Gram-negative *Pseudomonas fluorescens* mediated by protoplast fusion 1994

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Intracellular proteolysis and limited diversity of the *Bacillus thuringiensis* CryIA family of the insecticidal crystal proteins 1994

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Characterization of larvicidal toxin protein from *Bacillus thuringiensis* serovar *Japonensis* strain *Bubui* specific for scarabaeid beetles 1994

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Toxicity of activated CryI proteins from *Bacillus thuringiensis* to six forest Lepidoptera and *Bombyx mori* 1993

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Site-directed mutations in a highly conserved region of *Bacillus thuringiensis* delta-endotoxin affect inhibition of short circuit current across *Bombyx mori* midguts 1993

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Effects of toxicity of eliminating a cleavage site in a predicted interhelical loop in *Bacillus thuringiensis* CryIVB delta-endotoxin 1993

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Structural stability of *Bacillus thuringiensis* delta-endotoxin homolog-scanning mutants determined by susceptibility to proteases 1993

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An analysis of *Bacillus thuringiensis* delta-endotoxin action on insect-midgut-membrane permeability using a light-scattering assay 1993

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A specific binding protein from *Manduca sexta* for the insecticidal toxin of *Bacillus thuringiensis* ssp. *Berliner* 1993

5/6/64 0008841006 BIOSIS NO.: 199396005422

In vitro and in vivo proteolysis of the *Bacillus thuringiensis* ssp. *israelensis* CryIVD protein by *Culex quinquefasciatus* larval midgut protease 1993

5/6/65 0008678449 BIOSIS NO.: 199345109437

Interaction of *Bacillus thuringiensis* endotoxins with the insect midgut epithelium BOOK TITLE: Parasites and Pathogens of Insects, Vol. 2, Pathogens 1993

5/6/66 0008418909 BIOSIS NO.: 199294118750

PROCESSING OF DELTA ENDOTOXIN FROM *BACILLUS THURINGIENSIS* -SSP-KURSTAKI HD-1 AND HD-73 BY GUT JUICES OF VARIOUS INSECT LARVAE 1992

5/6/67 0008372318 BIOSIS NO.: 199294074159

PROTEOLYTIC PROCESSING OF DELTA ENDOTOXIN OF *BACILLUS THURINGIENSIS* -VAR-KURSTAKI HD-1 IN INSENSITIVE INSECT SPODOPTERA-LITURA UNUSUAL PROTEOLYSIS IN THE PRESENCE OF SODIUM DODECYL SULFATE 1992

5/6/68 0008350145 BIOSIS NO.: 199294051886

A BROAD-SPECTRUM CYTOLYTIC TOXIN FROM *BACILLUS THURINGIENSIS* -VAR-KYUSHUENSIS 1992

5/6/69 0008349692 BIOSIS NO.: 199294051533

MODE OF ACTION OF *BACILLUS THURINGIENSIS* TOXIN CRYIIIA AN ANALYSIS OF TOXICITY IN LEPTINOTARSA-DECEMLINEATA SAY AND DIABROTICA-UNDECIMPUNCTATA-HOWARDI BARBER 1992

5/6/70 0008174813 BIOSIS NO.: 199293017704

CYTOTOXICITY OF A CLONED *BACILLUS THURINGIENSIS* -SSP-ISRAELENSIS CRYIVB TOXIN TO AN AEDES-AEGYPTI CELL LINE 19

5/6/71 0007885743 BIOSIS NO.: 199192131514

- THE TOXIC MOIETY OF THE BACILLUS- THURINGIENSIS PROTOXIN UNDERGOES A CONFORMATIONAL CHANGE UPON ACTIVATION 1991
- 5/6/72 000760523 BIOSIS NO.: 1991043414  
FOLDING AND UNFOLDING OF THE PROTOXIN FROM BACILLUS- THURINGIENSIS EVIDENCE THAT THE TOXIC MOIETY IS PRESENT IN AN ACTIVE CONFORMATION 1990
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UNUSUAL PROTEOLYSIS OF THE PROTOXIN AND TOXIN FROM BACILLUS- THURINGIENSIS STRUCTURAL IMPLICATIONS 1990
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RESISTANCE TO BACILLUS- THURINGIENSIS BY THE INDIAN MEAL MOTH PLODIA-INTERPUNCTELLA COMPARISON OF MIDGUT PROTEINASES FROM SUSCEPTIBLE AND RESISTANT LARVAE 1990
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SPECIFICITY OF BACILLUS- THURINGIENSIS FOR LEPIDOPTERAN LARVAE FACTORS INVOLVED IN-VIVO AND IN THE STRUCTURE OF A PURIFIED PROTOXIN 1989
- 5/6/77 0006757405 BIOSIS NO.: 198988072520  
PROTEOLYTIC PROCESSING OF A COLEOPTERAN-SPECIFIC DELTA ENDOTOXIN PRODUCED BY BACILLUS- THURINGIENSIS -VAR- TENEBRIONIS 1989
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PURIFICATION AND PROPERTIES OF A 28-KILODALTON HEMOLYTIC AND MOSQUITOCIDAL PROTEIN TOXIN OF BACILLUS- THURINGIENSIS -SSP-DARMSTADTENSIS 73-E10-2 1989
- 5/6/79 0006721344 BIOSIS NO.: 198988036459  
FACILE PREPARATION AND CHARACTERIZATION OF THE TOXIN FROM BACILLUS- THURINGIENSIS -VAR-KURSTAKI 1989
- 5/6/80 0006590413 BIOSIS NO.: 1989870238304  
DIFFERENTIAL SPECIFICITY OF TWO INSECTICIDAL TOXINS FROM BACILLUS- THURINGIENSIS -VAR-AIZAWAI 1988
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SPECIFICITY OF BACILLUS- THURINGIENSIS DELTA ENDOTOXINS IS CORRELATED WITH THE PRESENCE OF HIGH-AFFINITY BINDING SITES IN THE BRUSH BORDER MEMBRANE OF TARGET INSECT MIDGUTS 1988
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ANALYSIS OF THE MOLECULAR BASIS OF INSECTICIDAL SPECIFICITY OF BACILLUS- THURINGIENSIS CRYSTAL DELTA ENDOTOXIN 1987
- 5/6/84 0005680096 BIOSIS NO.: 198784034245  
PURIFICATION OF THE MOSQUITOCIDAL AND CYTOLYTIC PROTEINS OF BACILLUS- THURINGIENSIS -SSP-ISRAELENSIS 1987
- 5/6/85 0005586906 BIOSIS NO.: 198783065797  
HOST SPECIFICITY OF THE BACILLUS- THURINGIENSIS DELTA ENDOTOXIN TOWARD LEPIDOPTERAN SPECIES SPODOPTERA-LITTORALIS BDV. AND PIERIS-BRASSICAE L 1987
- 5/6/86 0005215711 BIOSIS NO.: 198682062098  
SPECIFICITY OF BACILLUS- THURINGIENSIS -VAR-COLMERI INSECTICIDAL DELTA ENDOTOXIN IS DETERMINED BY DIFFERENTIAL PROTEOLYTIC PROCESSING OF THE PROTOXIN BY LARVAL GUT PROTEASES 1986
- 5/6/87 0005038756 BIOSIS NO.: 198681002647  
PROTEASE ACTIVATION OF THE ENTOMOCIDAL PROTOXIN OF BACILLUS- THURINGIENSIS -SSP-KURSTAKI 1985
- 5/6/88 0004740233 BIOSIS NO.: 198580049128  
DELINEATION OF A TOXIN -ENCODING SEGMENT OF A BACILLUS- THURINGIENSIS CRYSTAL PROTEIN GENE 1985
- 5/6/89 0004513711 BIOSIS NO.: 198529042610  
BIOSYNTHESIS OF THE INSECTICIDAL TOXIN FROM BACILLUS- THURINGIENSIS -SSP-ISRAELENSIS 1985
- 5/6/90 0004170099 BIOSIS NO.: 19847702010  
DELINEATION OF A TOXIN -ENCODING SEGMENT OF A BACILLUS- THURINGIENSIS CRYSTAL PROTEIN GENE
- DISSOLUTION AND DEGRADATION OF BACILLUS- THURINGIENSIS DELTA ENDO TOXIN BY GUT JUICE PROTEASE OF THE SILKWORM BOMBYX-MORI 1983
- 5/6/91 0003883478 BIOSIS NO.: 198375067421  
THE MAIN FEATURES OF BACILLUS- THURINGIENSIS DELTA ENDO TOXIN MOLECULAR STRUCTURE 1982
- 5/6/92 0003025269 BIOSIS NO.: 198070056756  
PURIFICATION OF THE INSECTICIDAL TOXIN IN CRYSTALS OF BACILLUS- THURINGIENSIS 1980
- 5/6/93 0002286900 BIOSIS NO.: 19781504387  
SOLUBLE GLYCO PROTEIN INSECT TOXIN FROM THE SPORE COAT OF BACILLUS- THURINGIENSIS 1978
- 5/6/94 0002100375 BIOSIS NO.: 197763021231  
FURTHER OBSERVATIONS ON THE MODE OF ACTION OF BACILLUS- THURINGIENSIS ON PAPILO-DEMOLEUS AND SPODOPTERA-LITURA 1976
- 5/7/86 DIALOG(R)File 5:BIOSIS Previews(R) (c) 2004 BIOSIS. All rts. reserv.  
0005215711 BIOSIS NO.: 198682062098  
SPECIFICITY OF BACILLUS- THURINGIENSIS -VAR-COLMERI INSECTICIDAL DELTA ENDOTOXIN IS DETERMINED BY DIFFERENTIAL PROTEOLYTIC PROCESSING OF THE PROTOXIN BY LARVAL GUT PROTEASES  
AUTHOR: HAIDER M Z (Reprint); KNOWLES B H; ELLAR D J  
AUTHOR ADDRESS: DEPARTMENT BIOCHEMISTRY, UNIVERSITY CAMBRIDGE, TENNIS COURT ROAD, CAMBRIDGE ENGLAND, CB2 1QW, UK\*\*UK  
JOURNAL: European Journal of Biochemistry 156 (3): p531-540 1986 ISSN: 0014-2956 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: The native crystal .delta.-endotoxin produced by *Bacillus thuringiensis* var. *colmeri*, serotype 21, is toxic to both lepidopteran (Pieris brassicae) and dipteran (*Aedes aegypti*) larvae. Solubilization of the crystal .delta.-endotoxin in alkaline reducing conditions and activation with trypsin and gut extracts from susceptible insects yielded a preparation whose toxicity could be assayed in vitro against a range of insect cell lines. After activation with *Aedes aegypti* gut extract the preparation was toxic to all of the mosquito cell lines but only one lepidopteran line (*Spodoptera frugiperda*), whereas an activated preparation produced by treatment with *P. brassicae* gut enzymes or trypsin was toxic only to lepidopteran cell lines. These in vitro results were paralleled by the results of in vivo bioassays. Gel electrophoretic analysis of the products of these different activation regimes suggested that a 130-kDa protoxin in the native crystal is converted to a 55-kDa lepidopteran-specific toxin by trypsin or *P. brassicae* enzymes and to a 52-kDa dipteran toxin by *A. aegypti* enzymes. Two-step activation of the 130-kDa protoxin by successive treatment with trypsin and *A. aegypti* enzymes further suggested that the 52-kDa dipteran toxin is derived from the 55-kDa lepidopteran toxin by enzymes specific to the mosquito gut. Confirmation of this suggestion was obtained by peptide mapping of these two polypeptides. The native crystal 130 kDa .delta.-endotoxin and the two insect-specific toxins all cross-reacted with antiserum to *B. thuringiensis* var. *kurstaki* P1 lepidopteran toxin. Preincubation of the two activated colmeri toxins with P1 antiserum neutralized their cytotoxicity to both lepidopteran and dipteran cell lines.
- 5/7/87 DIALOG(R)File 5:BIOSIS Previews(R) (c) 2004 BIOSIS. All rts. reserv.  
0005038756 BIOSIS NO.: 198681002647  
PROTEASE ACTIVATION OF THE ENTOMOCIDAL PROTOXIN OF BACILLUS- THURINGIENSIS -SSP-KURSTAKI  
AUTHOR: ANDREWS R E JR (Reprint); BIBLOS M M; BULLA L A JR  
AUTHOR ADDRESS: DEP MICROBIOL. IOWA STATE UNIV, AMES, IOWA 50011, USA\*\*USA  
JOURNAL: Applied and Environmental Microbiology 50 (4): p737-742 1985 ISSN: 0099-2240 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: Two isolates of *Bacillus thuringiensis* subsp. *kurstaki* were examined which produced different levels of intracellular proteases. Although the crystals from both strains had comparable toxicity, one of the strains, LB1, had a strong polypeptide band at 68,000 molecular weight in the protein from the crystals; in the other, HD251, no such band was evident. When the intracellular proteases in both strains were measured, strain HD251 produced less than 10% of the proteolytic activity found in LB1. These proteases were primarily neutral metalloproteases, although low levels of other proteases were detected. In LB1, the synthesis of protease increased as the cells began to sporulate; however, in HD251, protease activity appeared much later in the sporulation cycle. The protease activity in strain LB1 was very high when the cells were making crystal toxin, whereas in HD251 reduced proteolytic activity was present during crystal toxin synthesis. The insecticidal to (molecular weight, 68,000) from both strains could be prepared by cleaving the protoxin (molecular weight, 135,000) with trypsin, followed by ion-exchange chromatography. The procedure described gave quantitative recovery of toxic activity, and approximately half of the total protein was recovered. Calculations show that these results correspond to stoichiometric conversion of protoxin to insecticidal toxin. The toxicities of whole crystals, soluble crystal protein, and purified toxin from both strains were comparable.
- 5/7/88 DIALOG(R)File 5:BIOSIS Previews(R) (c) 2004 BIOSIS. All rts. reserv.  
0004740233 BIOSIS NO.: 198580049128  
DELINEATION OF A TOXIN -ENCODING SEGMENT OF A BACILLUS- THURINGIENSIS CRYSTAL PROTEIN GENE



AUTHOR: SCHNEPP H E (Reprint); WHITELEY H R  
AUTHOR ADDRESS: DEP MICROBIOLOGY AND IMMUNOLOGY, SC-42, SCH MED, UNIV WASHINGTON, SEATTLE, WA 98195, USA\*\*USA  
JOURNAL: Journal of Biological Chemistry 260 (10): p6273-6280 1985 ISSN: 0021-9258 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: Crystals of *B. thuringiensis* ssp. kurstaki HD-1-Dipel contain a MW 134,000 protoxin which can be cleaved by proteolysis to a peptide of MW approx. 70,000; this peptide is lethal to lepidopteran larvae. One analyzed the peptides produced by recombinant *Escherichia coli* strains bearing deletions and fusions of the protoxin gene in order to delineate the portion of the gene which encodes the toxic peptide. The recombinant strains produced the toxic peptide and larger peptides whose size was related to the length of the deleted gene. The amino-terminal 55% of the protoxin protein is sufficient for toxicity. While 2 different gene fusions to the 10th codon allowed the synthesis of toxic polypeptides, fusions to the 50th codon did not. 3' and deletions up to the 645th codon allowed synthesis of the toxic peptide, whereas a deletion to the 603rd codon yielded a non-toxic peptide. Some of the 5' and 3' alterations to the gene caused changes in the proteolytic cleavage patterns of the polypeptides synthesized by *E. coli*, suggesting that the alterations led to conformational changes in the proteins. The presence of different 3' end segments affected the levels of synthesis of the altered crystal proteins.

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0004513711 BIOSIS NO.: 198529042610  
BIOSYNTHESIS OF THE INSECTICIDAL TOXIN FROM BACILLUS- THURINGIENSIS -SSP-ISRAELENSIS  
AUTHOR: ANDREWS R E JR (Reprint); BULLA L A JR  
AUTHOR ADDRESS: DEPARTMENT MICROBIOLOGY, IOWA STATE UNIVERSITY, AMES, IOWA, USA\*\*USA  
JOURNAL: Abstracts of the Annual Meeting of the American Society for Microbiology 85 p183 1985  
CONFERENCE/MEETING: 85TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, LAS VEGAS, NEV., USA, MAR. 3-7, 1985. ABSTR ANNU MEET AM SOC MICROBIOL. ISSN: 0094-8519 DOCUMENT TYPE: Meeting  
RECORD TYPE: Citation LANGUAGE: ENGLISH

5/7/90 DIALOG(R)File 5:Biois Previews(R) (c) 2004 BIOSIS. All rts. reserv.  
0004170099 BIOSIS NO.: 198477002010  
DISSOLUTION AND DEGRADATION OF BACILLUS- THURINGIENSIS DELTA ENDO TOXIN BY GUT JUICE PROTEASE OF THE SILKWORM BOMBYX-MORI  
AUTHOR: TOJO A (Reprint); AIZAWA K  
AUTHOR ADDRESS: INST OF BIOL CONTROL, FAC OF AGRIC, KYUSHU UNIV, FUKUOKA 812, JPN\*\*JAPAN  
JOURNAL: Applied and Environmental Microbiology 45 (2): p576-580 1983 ISSN: 0099-2240 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH

ABSTRACT: The dissolution and degradation of delta-endotoxin (crystal) of *B. thuringiensis* subsp. kurstaki strain HD-1 were investigated. Crystals were dissolved in 0.1 M. phosphate-carbonate-NaOH buffer at pH > 12. Swelling of crystals occurred in the buffer between pH 10 and 11, and crystals dissolved in the same buffer supplemented with gut juice protease of the silkworm *B. mori*. The proteolytic dissolution of crystals occurred after a time lag of several minutes in 0.1 M carbonate-NaOH buffer, pH 10.2. The time lag was not observed when crystals were suspended in the buffer for 30 min. Before the addition of protease. After the dissolution of the crystals and further degradation of the solubilized protein, the appearance of a toxic protein with a MW of 59,000, designated P-59, was observed. Lower MW peptides (less than 40,000) showed no toxicity to the silkworm larvae on feeding. Digestion of the 120,000-dalton subunit of the crystal by gut juice protease also produced P-59. These observations suggest the occurrence of a similar process in vivo, i.e., the swelling of crystals due to the alkalinity of gut juice and the production of P-59, dependent on the hydrolysis of swollen crystals by gut juice protease.

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0003883478 BIOSIS NO.: 198375067421  
THE MAIN FEATURES OF BACILLUS- THURINGIENSIS DELTA ENDO TOXIN MOLECULAR STRUCTURE  
AUTHOR: CHESTUKHINA G G (Reprint); KOSTINA L I; MIKHAILOVA A L; TYURIN S A; KLEPIKOVA F S; STEPANOV V M  
AUTHOR ADDRESS: ISNT GENETICS AND SELECTION INDUSTRIAL MICROORGANISMS, 113545 MOSCOW, USSR\*\*USSR  
JOURNAL: Archives of Microbiology 132 (2): p159-162 1982 ISSN: 0302-8933 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH

ABSTRACT: The crystal-forming proteins (delta-endotoxins) produced by various serotypes of *B. thuringiensis* and toxic for Lepidoptera reveal the same pattern of molecular organization. These proteins (130,000-145,000 MW) contain an N-terminal domain (65,000-85,000 MW) resistant to proteolysis whereas their C-terminal moieties (65,000 MW) undergo an extensive degradation by trypsin that leads to stepwise cleavage off the fragments with MW of 15,000-35,000. The N-terminal domain from serotype V delta-endotoxin is active when introduced into the hemocoel of *Galleria mellonella* larvae. It corresponds to the true toxin normally formed by action of larva proteases on the crystal-forming protein (protoxin). Some differences were found in the properties of the N-terminal domains isolated from the crystal-forming proteins of III, V and IX serotypes, e.g., in their solubility, digestion by subtilisin, MW and the distribution of methionine residues along the polypeptide chains.

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0003025269 BIOSIS NO.: 198070056756  
PURIFICATION OF THE INSECTICIDAL TOXIN IN CRYSTALS OF BACILLUS- THURINGIENSIS  
AUTHOR: LILLEY M (Reprint); RUFFELL R N; SOMMERVILLE H J  
AUTHOR ADDRESS: SHELL RES LTD, SHELL BIOSCI LAB, SITTINGBOURNE RES CENT, SITTINGBOURNE ME9 8AG, KENT, ENGL, UK\*\*UK  
JOURNAL: Journal of General Microbiology 118 (1): p1-12 1980 ISSN: 0022-1287 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH

ABSTRACT: Crystals were purified from 4 serotypes of the insect pathogen *B. thuringiensis*. Crystals from these serotypes were similar in amino acid and N-terminal analyses, but differed in their toxicity to 2 spp. of Lepidoptera and in their immunological properties. Toxic polypeptides were obtained following trypsin digestion of solutions of the crystals. In 2 strain (serotypes 3 and 9), this fraction contained only 1 polypeptide. Similar results were obtained when dissolved crystals were digested with other proteolytic enzymes or with gut contents from *Plaris brassicae*. The trypsin-resistant polypeptide was further purified by gel and ion-exchange chromatography and had a MW of about 70,000, estimated by gel chromatography a gel electrophoresis. No evidence was obtained for a toxin of lower MW. This purified toxin accounted for most, if not all, of the toxic activity originally present in the crystal solution and was active by injection and ingestion. The purified toxic fraction from serotype 1 appeared to contain 2 polypeptides, one of which corresponded to that found with serotypes 3 and 9. There were no major differences in the composition of crystals from different serotypes of *B. thuringiensis* and it is concluded that trypsin-resistant polypeptide represents the active insecticidal toxin of the crystal.

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0002286900 BIOSIS NO.: 197815004387  
SOLUBLE GLYCO PROTEIN INSECT TOXIN FROM THE SPORE COAT OF BACILLUS- THURINGIENSIS  
AUTHOR: ARONSON J N; FOX S I  
JOURNAL: Federation Proceedings 37 (6): p1824-1978 1978 ISSN: 0014-9446 DOCUMENT TYPE: Article  
RECORD TYPE: Citation LANGUAGE: Unspecified

5/7/94 DIALOG(R)File 5:Biois Previews(R) (c) 2004 BIOSIS. All rts. reserv.  
0002100375 BIOSIS NO.: 197763021231  
FURTHER OBSERVATIONS ON THE MODE OF ACTION OF BACILLUS- THURINGIENSIS ON PAPILIO-DEMOLEUS AND SPODOPTERA-LITURA  
AUTHOR: NARAYANAN K; JAYARAJ S; GOVINDARAJAN R  
JOURNAL: Journal of Invertebrate Pathology 28 (2): p269-270 1976 ISSN: 0022-2011 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: Unspecified

ABSTRACT: The influence of reducing substances (oxalic acid, ascorbic acid) and proteolytic enzyme activity of the guts of instar larvae of these insects was investigated to understand better the mode of action of *B. thuringiensis*. The average time required to effect 100% mortality was 1/2 to 1 day in *P. demoleus* as against no mortality in *S. litura*. The highly susceptible *P. demoleus* contained the highest amount of 325 .mu.g/g ascorbic acid as against 194 .mu.g/g in *S. litura*. *S. litura* contained 481.0 .mu.g/g of total phenol and 379 .mu.g/g of OD [orthodihydroxy] phenol and was resistant to *B. thuringiensis* infection. Larvae of *P. demoleus*, highly susceptible to the pathogen, showed noticeably lower amounts of total phenol (215 .mu.g/g) and OD phenol (111 .mu.g/g). *P. demoleus* showed a higher amount of proteolytic enzyme activity (0.425 units) than *S. litura* (0. units). The gut pH of *P. demoleus* was 9.7-10.0 and that of *S. litura* 8.2-8.5. The solubility of the toxic crystal in vivo as a result of the high gut pH in *P. demoleus* probably accounted for the high susceptibility of this species. The presence of large amount of reducing substances like ascorbic acid and phenols favored the S-S bond cleavage. When the S-S bond was broken, the protein moiety of the toxin was acted upon by the proteases. A low pH and low ascorbic acid and phenol contents along with comparatively less proteolytic activity of the gut were the possible factors governing non-susceptibility of *S. litura* to *B. thuringiensis*.

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Expression of a *Bacillus thuringiensis* cryIC gene in plasmid confers high insecticidal efficacy against tobacco cutworm: A Spodoptera insect. 2  
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Expression in *Plachia pastoris* and purification of a membrane-acting immunotoxin based on a synthetic gene coding for the *Bacillus thuringiensis* Cry2Aa1 toxin. 2003

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Heterologous expression of cry2 gene from a local strain of *Bacillus thuringiensis* isolated in Nigeria. 2002

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CryIA toxins of *Bacillus thuringiensis* bind specifically to a region adjacent to the membrane-proximal extracellular domain of BT-R1 in *Manduca sexta*: involvement of a cadherin in the entomopathogenicity of *Bacillus thuringiensis*. 2002

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CryIAg1: A novel entomocidal protein from *Bacillus thuringiensis* subsp. *aegypti* strain C18. 2001

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Expression and biochemical characterization of the *Bacillus thuringiensis* Cry4B alpha1-alpha5 pore-forming fragment. 2001

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Comparative insecticidal properties of two nucleopolyhedrovirus vectors encoding a similar toxin gene chimera. 2000

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The mode of action of a dipteran-specific bioinsecticide, Cry4A produced by *Bacillus thuringiensis*. 2000

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Characterization of a *Bacillus thuringiensis* delta-endotoxin which is toxic to insects in three orders. 2000

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Expression of the mosquitoicidal cryIb gene under the control of different promoters in *Bacillus sphaericus* 2362 and acrySTALLIFEROUS *Bacillus thuringiensis* subsp. *israelensis* c4Q2-72. 2000

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*Bacillus thuringiensis* CryIAa toxin-binding region of *Bombix mori* aminopeptidase N. 1999

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Production of chymotrypsin-resistant *Bacillus thuringiensis* Cry2Aa1 delta-endotoxin by protein engineering. 1999

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Amino acid substitution in alpha-helix 7 of CryIAC delta-endotoxin of *Bacillus thuringiensis* leads to enhanced toxicity to *Helicoverpa armigera* Hubner. 1999

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*Bacillus thuringiensis* insecticidal CryIAa toxin binds to a highly conserved region of aminopeptidase N in the host insect leading to its evolutionary success. 1999

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Cloning and expression of the binary toxin genes of *Bacillus sphaericus* C3-41 in a crystal minus *B. thuringiensis* subsp. *israelensis*. 1999

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Role of *Bacillus thuringiensis* toxin domains in toxicity and receptor binding in the diamondback moth. 1999

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The introduction into *Bacillus sphaericus* of the *Bacillus thuringiensis* subsp. *medellin* cryIIAb1 gene results in higher susceptibility of resistant mosquito larva populations to *B. sphaericus*. 1998

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Biochemical characterization of the third domain from *Bacillus thuringiensis* CRYIA toxins. 1998

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Cloning and expression of the cryIEa4 gene of *Bacillus thuringiensis* and the comparative toxicity of its gene product. 1998

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Cloning and characterization of *Manduca sexta* and *Plutella xylostella* midgut aminopeptidase N enzymes related to *Bacillus thuringiensis* toxin binding proteins. 1997

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Isolated domain II and III from the *Bacillus thuringiensis* CryI Ab delta-endotoxin binds to lepidopteran midgut membranes. 1997

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Thermodynamic analysis of the domain organization of *Bacillus thuringiensis* toxins. 1996

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Cloning, expression and toxicity of a mosquitoicidal toxin gene of *Bacillus thuringiensis* subsp. *Medellin*. 1997

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*Poplar* (*Populus nigra* L.) plants transformed with a *Bacillus thuringiensis* toxin gene: Insecticidal activity and genomic analysis. 1996

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High-level transcription of the cryIIA toxin gene of *Bacillus thuringiensis* depends on a second promoter located 600 bp upstream of the translational start site. 1996

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Thermo-inducible expression of delta endotoxin gene of *Bacillus thuringiensis* HD1 derived under lambda P-L promoter in *Escherichia coli*. 199

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A cloning of a capsule operon of anthracis microbe and its use for identification of virulent strains of *Bacillus anthracis*. 1994

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The Insecticidal CryIb Crystal Protein of *Bacillus thuringiensis* ssp. *thuringiensis* Has Dual Specificity to Coleopteran and Lepidopteran Larva. 1995

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Insect-resistant chrysanthemum calluses by introduction of a *Bacillus thuringiensis* crystal protein gene. 1993

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A complete physical map of a *Bacillus thuringiensis* chromosome. 1993

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Heterologous expression of *Bacillus thuringiensis* var. *tenebrionis* toxin gene in *Escherichia coli* 1992
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Genomic amplification and expression of delta-endotoxin fragment of *Bacillus thuringiensis* 1992
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INSECTICIDAL PROPERTIES OF A CRYSTAL PROTEIN GENE PRODUCT ISOLATED FROM *BACILLUS-THURINGIENSIS* -SSP-KENYAE 1992
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MOLECULAR CLONING OF THE 130-KILODALTON MOSQUITOCIDAL DELTA ENDOTOXIN GENE OF *BACILLUS-THURINGIENSIS* -SSP-ISRAELENSIS IN *BACILLUS-Sphaericus* 1990
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- 8/6/59 0006163148 BIOSIS NO.: 198886003069  
INSECT RESISTANCE IN TRANSGENIC PLANTS EXPRESSING *BACILLUS-THURINGIENSIS* TOXIN GENES 1987
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CHARACTERIZATION OF THE GENE ENCODING THE HEMOLYTIC TOXIN AND THE MOSQUITOCIDAL DELTA ENDOTOXIN OF *BACILLUS-THURINGIENSIS* -ISRAELENSIS 1986
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PURIFICATION AND CHARACTERIZATION OF THE ACTIVE FRAGMENT FROM *BACILLUS-THURINGIENSIS* DELTA TOXIN 1986
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CLONING AND EXPRESSION OF THE LEPIDOPTERAN TOXIN PRODUCED BY *BACILLUS-THURINGIENSIS* -VAR-*THURINGIENSIS* IN *ESCHERICHIA-COLI* 1986
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MODE OF ACTION OF BIPYRAMIDAL DELTA ENDOTOXIN OF *BACILLUS-THURINGIENSIS* -SSP-KURSTAKI HD-1 1986
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ISOLATION AND ASSAY OF THE TOXIC COMPONENT FROM THE CRYSTALS OF *BACILLUS-THURINGIENSIS* -VAR-ISRAELENSIS 1985
- 8/6/73 0003872627 BIOSIS NO.: 198375056570  
CLONING AND LOCALIZATION OF THE LEPIDOPTERAN PRO TOXIN GENE OF *BACILLUS-THURINGIENSIS* -SSP-KURSTAKI 1982
- 8/7/67 *DIALOG(R)File 5: Biosis Previews(R) (c) 2004 BIOSIS. All its. reserv.*  
0005579495 BIOSIS NO.: 198783058386  
PURIFICATION AND CHARACTERIZATION OF THE ACTIVE FRAGMENT FROM *BACILLUS-THURINGIENSIS* DELTA TOXIN  
AUTHOR: TYSKI S (Reprint); FUJII Y; LAI C-Y  
AUTHOR ADDRESS: DEP OF PROTEIN BIOCHEMISTRY, ROCHE RES CENT, HOFFMANN-LA ROCHE INC, NUTLEY, N 07110, USA\*\*USA  
JOURNAL: Biochemical and Biophysical Research Communications 141 (1): p 106-111 1986 ISSN: 0006-291X  
DOCUMENT TYPE: Article RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: Limited tryptic hydrolysis of a partially purified delta-toxin (M<sub>r</sub>=100,000) from *Bacillus thuringiensis* has produced a polypeptide fragment of Mr=60,000 containing the full biological activity. The fragment was the only polypeptide observed in the polyacrylamide-gel electrophoresis of the delta-toxin after treatment with trypsin and could be purified by DEAE-cellulose chromatography. Amino acid and partial sequence analyses indicate that the 60,000 Mr fragment has been derived from the mid-section of the holotoxin peptide; over 80% of Lys, 65% of Pro and 50% of His residues in the holotoxin have been lost in active fragment. This section must contain the active site since its specific insecticidal activity is approximately twice that of the holotoxin. The active fragment shows complete cross-reactivity with the antiserum raised against the native toxin, and appeared to possess higher thermal stability than the mother protein. It provides a powerful tool for studies of the structure involved in the insecticidal activity.
- 8/7/71 *DIALOG(R)File 5: Biosis Previews(R) (c) 2004 BIOSIS. All its. reserv.*  
0005127000 BIOSIS NO.: 198681090891  
MODE OF ACTION OF BIPYRAMIDAL DELTA ENDOTOXIN OF *BACILLUS-THURINGIENSIS* -SSP-KURSTAKI HD-1  
AUTHOR: TOJO A (Reprint)  
AUTHOR ADDRESS: INST BIOLOGICAL CONTROL, FAC AGRICULTURE, KYUSHU UNIV, FUKUOKA 812, JAPAN\*\*JAPA  
JOURNAL: Applied and Environmental Microbiology 51 (3): p630-633 1986 ISSN: 0099-2240 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: The mode of action of toxic fragment (P-59) derived from bipyramidal-shaped delta-endotoxin of *Bacillus thuringiensis* subsp. kurstaki HD-1 on the silkworm *Bombyx mori* was investigated. An enzyme-linked immunosorbent assay showed that there was no translocation of P-59 from the gut lumen to the hemocoel. When membrane vesicles prepared from silkworm midgut were incubated with P-59, normally smooth surface of vesicles became rough, and patch formation was observed on the surface. Vesicles treated with P-59 tended to agglutinate. The vesicle-denaturing activity of a 130,000-dalton subunit protein of bipyramidal toxin was enhanced by treatment with a gut juice protease of the silkworm. P-59 did not cause any uncoupling effect on mitochondria of the silkworm midgut. These results suggest that the attacking site of this toxin is in the mitochondrion but the cell membrane of the susceptible cell.
- 8/7/72 *DIALOG(R)File 5: Biosis Previews(R) (c) 2004 BIOSIS. All its. reserv.*  
0004640586 BIOSIS NO.: 198579059485  
ISOLATION AND ASSAY OF THE TOXIC COMPONENT FROM THE CRYSTALS OF *BACILLUS-THURINGIENSIS* -VAR-ISRAELENSIS  
AUTHOR: DAVIDSON E W (Reprint); YAMAMOTO T  
AUTHOR ADDRESS: DEP ZOOLOGY, ARIZ STATE UNIV, TEMPE, AZ 85287, USA\*\*USA  
JOURNAL: Current Microbiology 11 (3): p171-174 1984 ISSN: 0343-8651 DOCUMENT TYPE: Article  
RECORD TYPE: Abstract LANGUAGE: ENGLISH  
ABSTRACT: The 25-Kdal [kilodalton] fragment of the 28-Kdal toxic protein extracted from *B. thuringiensis* var. *israelensis* crystals is responsible for the insecticidal, cytolytic, hemolytic and mouse-lethal activities of the crude toxin extract. This activity has no relation to the hemolysis produced by other strains of *B. thuringiensis*. This protein was rich in the amino acid Asp and Glu, but did not contain Cys.



12/6/174	00152900	**Image available** NUCLEOTIDE SEQUENCES CODING FOR POLYPEPTIDES EXERCISING A LARVICIDAL EFFECT IN LEPIDOPTERA SEQUENCES DE NUCLEOTIDIQUES CODANT POUR DES POLYPEPTIDES DOTES D'UNE ACTIVITE LARVICIDE VIS-A-VIS DE LEPIDOPTERES Publication Language: French Fulltext Availability: Detailed Description Claims Fulltext Word Count: 13893 Publication Year: 1988
12/6/175	00151972	NOVEL BACILLUS THURINGIENSIS STRAINS, METHOD FOR THEIR ISOLATION AND RELATED INSECTICIDAL COMPOSITIONS NOUVELLES SOUCHES DE BACILLUS THURINGIENSIS , PROCEDE PERMETTANT LEUR ISOLATION ET COMPOSITIONS INSECTICIDES S'Y RAPPORTANT Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 7983 Publication Year: 1988
12/6/176	00149737	HYBRID GENES INCORPORATING A DNA FRAGMENT CONTAINING A GENE CODING FOR AN INSECTICIDAL PROTEIN, PLASMIDS TRANSFORMED CYANOBACTERIA EXPRESSING SUCH PROTEIN AND METHOD FOR USE AS A BIOCONTROL AGENT GENE HYBRIDE A FRAGMENT D'ADN CONTENANT LE GENE DE CODAGE D'UNE PROTEINE INSECTICIDE, PLASMIDES, CYNOBACTERIE TRANSFORMEES D'EXPRESSION DE CETTE PROTEINE ET LEUR PROCEDE D'UTILISATION COMME AGENT BIOCIDE Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 8217 Publication Year: 1988
12/6/177	00145146	METHOD FOR PRODUCING A HETEROLOGOUS PROTEIN IN INSECT CELLS PROCEDE DE PRODUCTION DE PROTEINES HETEROLOGUES DANS DES CELLULES D'INSECTES Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 4846 Publication Year: 1988
12/6/178	00138443	AGRICULTURAL-CHEMICAL-PRODUCING ENDOSYMBIOTIC MICROORGANISMS AND METHOD OF PREPARING AND USING SAME MICRO-ORGANISMES' ENDOSYMBIOTIQUES FABRICANT DES PRODUITS CHIMIQUES AGRICOLES, ET LEUR PROCEDE DE PREPARATION ET D'UTILISATION Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 24446 Publication Year: 1987
12/6/179	00132093	**Image available** CYSTEINE-DEPLETED MUTAINS OF BIOLOGICALLY ACTIVE HUMAN TUMOR NECROSIS FACTOR PROTEINS MUTEINS DEPOLYMERES DE CYSTEINE DE PROTEINES DU FACTEUR NECROTIC TUMORAL HUMAIN BIOLOGIQUEMENT ACTIF Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 8989 Publication Year: 1986
12/6	K/180 00129030	**Image available** BACILLUS THURINGIENSIS CRYSTALLINE PROTEIN GENE TOXIN SEGMENT/SEGMENT DE LA TOXINE DU GENE DE LA PROTEINE CRISTALLINE DU BACILLUS THURINGIENSIS Patent: WO 8601536 A1 19860313 Publication Language: English Fulltext Availability: Detailed Description Claims Fulltext Word Count: 11702 Publication Year: 1986
English Abstract: A DNA fragment that codes for the portion of Bacillus thuringiensis crystal protein peptide that is toxic to lepidopteran insects The invention also comprises the DNA... ...invention demonstrates that the disclosed toxin-encoding DNA fragment (referred to herein as the Bacillus thuringiensis crystal protein gene toxin segment) is expressible in recombinant host organisms, and that the "toxin... French Abstract: Un fragment d'ADN code la partie du peptide de proteine cristalline du Bacillus thuringiensis qui est toxique pour des insect lepidopteres. L'invention porte egalement sur les sequences d...la toxine (appelee segment de la toxine du gene de la proteine cristalline du Bacillus thuringiensis peut etre exprime dans des organismes recombinants hotes, et que le produit de la proteine... Detailed Description: ... this invention relates to an expressible DNA fragment coding for the toxin portion of Bacillus thuringiensis crystal protein. Background of the invention: As is well known Bacillus thuringiensis crystal protein is toxic to the larvae of a number of lepidopteran insects As a result preparations containing Bacillus thuringiensis crystals are used commercially as a highly selective biological insecticide Unfortunately relatively high manufacturing costs... ...difficult for such insecticides to compete effectively with other commercially available products. Wild-type Bacillus thuringiensis produce crystal protein only during sporulation. Such a growth phase limitation, particularly in an industrial... ...15, 1984 and August 21, 1984, respectively to Schneft and Whiteley, disclose expression of Bacillus thuringiensis crystal protein by use o novel recombinant plasmids containing expressible heterologous DNA coding for crystal... ...disclose that genetically engineered bacterial host strains transformed by the novel recombinant plasmids express Bacillus thuringiensis crystal protein protoxin polypeptides. Such genetically engineered bacterial host strains express Bacillus thuringiensis crystal protein protoxin polypeptide at all stages of growth.		

It is now known that in the *Bacillus thuringiensis* subspecies that synthesize lepidopteran toxins the crystal protein crystal is composed of one or more...

...To that end it would be useful to identify the specific segment of a *Bacillus thuringiensis* crystal protein gene that codes for the toxin fragments. It would also be useful to...gene, including some 51 and 31' flanking sequences. The start sites of transcription in *Bacillus thuringiensis* (Bt and Btl) and in *Escherichia coli* (Ec) are indicated as well as the entire...

...It is an object of the present invention to identify the segment of a *Bacillus thuringiensis* crystal protein gene referred to herein as the 'toxin-encoding' segment, which codes for the...

...present invention to determine the DNA sequence of the 'toxin-encoding' segment of a *Bacillus thuringiensis* crystal protein gene. It is a further object of the present invention to demonstrate that a *Bacillus thuringiensis* crystal protein 'toxin-encoding' gene segment is expressible in transformed recombinant host organisms. It is...

...protein gene; FIGURE 2 (Views A and B) shows the DNA sequence of a *Bacillus thuringiensis* crystal protein gene; FIGURE 3 (Views A and B) shows restriction maps of pES1 and...

...shows the construction strategy for the 31-end deletions of a crystal protein @5 *Bacillus thuringiensis* crystal protein. Nucleotides 4140 through 4185 comprise the transcriptional terminator for this gene. FIGURE 3A...that is itself toxic to lepidopteran insects. The phrase 'amino terminal 55%' of the *Bacillus thuringiensis* crystal protein gene' means the amino terminal 645 codons of the crystal protein gene as...

...used herein the phrase 'final 74 codons' means the final 74 codons of the *Bacillus thuringiensis* crystal protein gene as shown in FIGURES-2A and 2B. More specifically the final 74...

...1982; Schnepf and Whiteley, 1981) we have cloned a crystal protein gene from *Bacillus thuringiensis* subspecies kurstaki HD-10 (Dipel and have shown that the gene is located on a...well with molecular weights determined for the protoxins from *Bacillus thuringiensis* subsp. kurstaki and subsp. *thuringiensis*. In addition the deduced amino acid composition is very similar to the chemically determined amino...

...purified protoxin of *Bacillus thuringiensis* subsp. kurstaki (5ga Table II supra.) Knowing that the *Bacillus thuringiensis* crystal protein protoxin can be cleaved to yield a smaller toxin fragment we created recombinant *Escherichia coli* strains bearing deletions and fusions of the crystal protein gene and then analyzed the proteins they produced to delineate the portion of the gene which encodes the toxin peptide. Construction of these 'deletion and fusion' plasmids is discussed in the Materials and Methods section? z112ra; also zge

FIGURES 3 The truncated peptides produced by recombinant hosts transformed by these plasmids are discussed in Examples II through V. Very generally the truncated peptides produced by host strains transformed by the 'deletion' and 'fusion' plasmids indicate that the amino terminal 55% of the crystal protein gene encodes sufficient information to produce a lepidopteran toxin. More specifically the 'deletion' and 'fusion' results indicate that deletions to the 50th codon from the 51' end of the gene or to the 603rd codon from the 31' end abolish toxicity while deletions to the 10th codon from the 51' end, or to the 645th codon from the...sequence was required to determine which portion of the crystal protein gene coded for the 'toxin' portion of the crystal protein the DNA sequence for the remainder of the gene was...

...from bases 7845 to 3831 in FIGURE 1B was sequenced primarily by the DNase I deletion method of Hong (1982) (z1je numbered sites in FIGURE 1B) but some gaps in the coding strand sequence were filled in by obtaining deletions through partial Sau3AI digestion (asterisks in FIGURE 1B). The complete sequence was determined for both...protoxins from *Bacillus thuringiensis* subsp. kurstaki (Bulla, et al., 1981) and subsp. *thuringiensis* (Hubert et al., 1981). The deduced amino acid composition is very similar to the...the crystal protein gene encodes a toxic peptide and that the 31' end of the toxin-encoding portion was in the HindIII-E fragment. To determine the 31' end of this region more precisely a number of deleted plasmids were constructed. See FIGURE 6A. The crystal protein encoding sequence in these plasmids terminated...Claim... and 2B. 2e A composition of matter comprising the amino terminal 55% of a *Bacillus thuringiensis* crystal protein gene as shown in FIGURES 2A and 2B.

39 A DNA sequence having...

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